EVALUATION OF A COMPREHENSIVE DAILY MOUTH CARE PROGRAM FOR LONG-TERM CARE FACILITIES

by

LEEANN RACHEL DONNELLY

B.Sc., The University of British Columbia, 2002

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

in

THE FACULTY OF GRADUATE STUDIES

(DENTAL SCIENCE)

THE UNIVERSITY OF BRITISH COLUMBIA

April 2005

© Leeann Rachel Donnelly, 2005
Objective: A randomized, controlled clinical trial involving 2 long-term care facilities was designed to test whether a comprehensive daily mouth care program for LTC facilities could reduce gingivitis, denture stomatitis and debris on teeth and dentures. A questionnaire was also used to assess an improvement in knowledge, behaviour and attitudes of nursing staff with respect to the provision of daily mouth care.

Materials and Methods: A four month, random, controlled clinical trial of a comprehensive daily mouth care program for caregivers in a long-term care facility was evaluated using both a questionnaire conducted with caregivers and an oral examination of residents. Two, 51-bed extended long-term care facilities in Vancouver, British Columbia owned and operated by one individual were asked to participate in the evaluation of the program. The program was implemented in one site, while the other site acted as a negative control. Nine caregivers from the test site and 13 from the control site completed both the pre and post questionnaire related to mouth care knowledge, performance and attitude. Twenty-four residents from the test site and 19 from the control site gave consent and were available for oral examination at baseline, 1 and 4 months. Gingivitis was measured using the Modified Gingival Index, and denture stomatitis using Newton's Classification. The debris (food and plaque) was quantified using the Modified Debris Index.

Results: No statistically significant change in the caregiver's knowledge, attitude or behaviour was found after the implementation of the program. At both the test and control site there was no improvement in mean debris on teeth or gingivitis scores. There was a statistically significant decrease in debris on dentures at the test site and a decrease in denture stomatitis that was not statistically significant. A decrease in debris on dentures and stomatitis was evident at the control site, but due to small numbers the findings could not be analyzed statistically.

Conclusion: The comprehensive daily mouth care program used did not result in a decrease in debris on teeth or gingivitis in residents of a long-term care facility. A decrease in debris on dentures and stomatitis was evident indicating caregivers were better able to clean dentures than teeth. Although staff may appreciate the structure and guidance of a mouth care program it did not result in an improvement in clinical outcomes, attitude, knowledge or behaviour.
TABLE OF CONTENTS

Abstract................................................................................................................................. ii
Table of Contents.................................................................................................................. iii
List of Tables.......................................................................................................................... vi
List of Figures.......................................................................................................................... vii
Acknowledgements................................................................................................................ viii
Dedication............................................................................................................................... x

CHAPTER 1: INTRODUCTION......................................................................................... 1

CHAPTER 2: REVIEW OF THE LITERATURE .............................................................. 4
2.1 Long-Term Facilities........................................................................................................ 4
2.2 Oral Health of Residents in Long-Term Care Facilities............................................. 7
2.3 Dental Caries.................................................................................................................... 8
2.4 Periodontal Diseases....................................................................................................... 9
2.5 Denture Stomatitis.......................................................................................................... 11
2.6 Oral Hygiene Education in Long-Term Care Facilities............................................. 12
2.7 UBC-PHC Geriatric Program Comprehensive Daily Mouth Care Program............. 18
   2.7.1 Modifications to the UBC-PHC Comprehensive Daily Mouth Care Program ...... 29
2.8 Summary of the Literature............................................................................................ 30
2.9 Objectives....................................................................................................................... 31

CHAPTER 3: MATERIAL AND METHODS................................................................. 32
3.1 LTC Facilities Participating in the Study...................................................................... 32
3.2 Daily Mouth Care Assessment...................................................................................... 32
3.3 Nursing Staff Participants: Questionnaire.................................................................... 33

iii
<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mouth Care Practice Guidelines Braddan Private Hospital</td>
<td>76</td>
</tr>
<tr>
<td>2</td>
<td>Algorithm: Routine Care - Conscious Resident</td>
<td>88</td>
</tr>
<tr>
<td>3</td>
<td>Algorithm: Routine Care – Unconscious Resident</td>
<td>89</td>
</tr>
<tr>
<td>4</td>
<td>Algorithm: Specialized Care</td>
<td>90</td>
</tr>
<tr>
<td>5</td>
<td>Mouth Care Products and Price List</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>Nursing Oral Assessment</td>
<td>92</td>
</tr>
<tr>
<td>7</td>
<td>Mouth Care Cards</td>
<td>94</td>
</tr>
<tr>
<td>8</td>
<td>Administrator Consent (Test &amp; Control)</td>
<td>97</td>
</tr>
<tr>
<td>9</td>
<td>Facility Assessment</td>
<td>99</td>
</tr>
<tr>
<td>10</td>
<td>Questionnaire</td>
<td>102</td>
</tr>
<tr>
<td>11</td>
<td>Subject Consent</td>
<td>104</td>
</tr>
<tr>
<td>12</td>
<td>Audit Results</td>
<td>106</td>
</tr>
</tbody>
</table>
| Table 1:    | Functional Assessment Tools: AIDL & ADL
| Table 2:   | Mean UBC-ODI Scores for Braddock and Point Grey at Baseline, 1 & 4 Months
| Table 3:   | Denture Cleanliness for Braddock at Baseline, 1 & 4 Months
| Table 4:   | Denture Cleanliness for Point Grey at Baseline, 1 & 4 Months
| Table 5:   | Gingivitis Scores; Mean UBC-GBI for Braddock and Point Grey at Baseline, 1 & 4 Months
| Table 6:   | Maxillary Denture Stomatitis for Braddock at Baseline, 1 & 4 Months
| Table 7:   | Mandibular Denture Stomatitis for Braddock at Baseline, 1 & 4 Months
| Table 8:   | Maxillary Denture Stomatitis for Point Grey at Baseline, 1 & 4 Months
| Table 9:   | Frequency of Correct Responses to T/F questions on Pre/Post Questionnaire for Braddock and Point Grey
| Table 10:  | Response rate of caregivers who completed the pre/post-questionnaire regarding barriers they experience in the provision of mouth care
| Table 11:  | Attitude statement response rates from all caregivers completing the pre/post questionnaire at Braddock
| Table 12:  | Attitude statement response rates from all caregivers completing the pre/post questionnaire at Point Grey
LIST OF FIGURES

Figure 1: Current Placement in Long-Term Care in British Columbia .................. 6

Figure 2: Oral Care Products Used With the UBC/PHC Daily Mouth Care Program ................................................................................................................. 22

Figure 3: Age of Resident Participants .................................................................. 41

Figure 4: Dentate Status of Resident Participants .................................................. 41

Figure 5: Intra-oral Photo’s of Two Resident Participants Gingiva ....................... 61
Acknowledgements

I was very fortunate to have such a knowledgeable and supportive supervisor and committee to help guide me through this thesis.

I would first like to thank my supervisor, Dr. Chris Wyatt for giving me the opportunity to work with the UBC Geriatric Dentistry program, for which this comprehensive daily mouth care program was developed. I would also like to thank him for his on-going support and his belief in its development as well as the encouragement he gave me to test it within this thesis.

To my committee of Dr. Donald Brunette, Professor Bonnie Craig and Carolle Sauro I would like to extend my deepest gratitude for all the support and guidance they gave me through this process.

Dr. Donald Brunette provided me with a greater understanding of research and methodology, and was always an inspiration to me in regards to what a good researcher could be. He is also the only person I know who could make the study of statistics and research fun and enjoyable.

Carolle Sauro, a Clinical Nurse Specialist helped me from day one to understand the complexities of the residents of long-term care and how to work collaboratively within a health care team. While in the assessment phase of this program she helped me find the right people to work with to make the program a reality. Throughout the development and implementation of the program she continued to support my efforts on all levels within the Providence Health Care Organization. Much of the program tested in this thesis would have only been an idea if Carolle had not been so supportive and influential with management and staff of the residential care sites. I would also like to
thank Carolle for introducing me to her husband Dr. Stephen Hansen whom consulted with me on the components and process of questionnaires. I am very grateful for the volunteered time, advice, and resources Dr. Hansen gave me to develop the questionnaire for this thesis. It was a pleasure to work with someone who was so knowledgeable and understanding.

Professor Bonnie Craig has been my mentor from the day I entered the Bachelor of Dental Science program at UBC. Her encouragement from the very beginning to think outside of the box and strive to reach my full potential is what has got me to this place now. Without the years of her support, encouragement and friendship I would certainly not be where I am today. I only hope that I can inspire future dental hygienists the way she has inspired me.

Special thanks to Ms. Judy Laird for her assistance with ethical approval, as well as her friendship and support for the past five years, to Phillip Feely who spend many hours working with me to analyze my data and search for literature I am very grateful, and to Dr. Frankie So who donated his time to this study as an examiner while visiting our university for 1 year from Hong Kong to observe the Geriatric Dentistry Program. They were all a great help and I hope to work with them again in the future.

I would also like to acknowledge Salix for their donation of saliva stimulants and Proctor and Gamble for their donation of Crest Anti-Cavity Protection toothpaste for use in this study.
DEDICATION

To my parents,

Edward and Evelyn Donnelly

Thank you for all your love, encouragement and support
Chapter 1: Introduction


Due to limited functional ability and cognitive impairments, many LTC residents must rely on caregivers to help them with their activities of daily living, including mouth care (Frenkel et al. 2001, Glassman et al. 1994). Unfortunately, there are many barriers to the provision of daily mouth care. Lack of time, knowledge, training and supplies, as well as psychological barriers to working in another person's mouth are frequently cited by caregivers as reasons for not performing daily mouth care (Chalmers et al. 1996, Logan et al. 1991, Adams R 1996, Wardh et al. 1997, Frenkel et al. 2002). Caregivers have also reported that they feel ill-prepared to provide daily mouth care procedures and find it unpleasant and unrewarding to perform (Eadie & Schou 1992, Chalmers et al. 1996, MacEntee et al. 1999, Frenkel et al. 2002). This coupled with their perception that
daily mouth care is an additional task in their already busy schedule may impact negatively the quality and quantity of mouth care received by LTC residents.

The numbers of older adults entering LTC facilities with some or all of their natural teeth is steadily increasing (White et al. 1995, Wyatt 2002a). It is projected that approximately 19% of our population will be over 65 years of age by 2021 and will reach 25% by 2041 (Statistics Canada 2001). Of the older adult population those 85 and over are the fastest growing group (Statistics Canada 2001). A percentage of these individuals will reside in LTC facilities, so it is imperative to develop strategies now that can be used to address the oral health needs of this population in the near future. It has been proposed that a comprehensive daily mouth care program is best for LTC facilities (Matear 1999). The development and evaluation of a comprehensive daily mouth care program that includes assessment of current practices, written practice guidelines and protocols, theoretical and hands-on education, and on-going weekly support from a dental professional should improve and increase the occurrence of daily mouth care ultimately benefiting residents of LTC facilities.

A number of studies have focused on educating caregivers about the importance of daily mouth care and the techniques for providing that care (Charteris & Kinsella 2001, Kubilius et al. 2003, Frenkel et al. 2001& 2002, Isaksson et al. 2000, Simons et al. 2000, Sweeney et al. 2000, Sumi et al. 2002). However several studies have shown that the education has only a short term effect on the caregiver's attitude and provision of mouth care (Kaz & Schuchman 1998, Brown 1994, MacEntee et al. 1999, Weeks & Fiske...
1999). Lack of structure, available resources and on-going support from a dental professional may be factors in the limited success of past educational interventions.

A review of the literature on Pub-Med failed to identify a comprehensive daily mouth care program that results in a reduction of plaque, debris, gingivitis and denture stomatitis. A daily mouth care program has been in place at Providence Health Care (PHC) for the past 3 years. The program was developed as part of the University of British Columbia - Providence Health Care (UBC-PHC) Geriatric Dentistry Program. This unique program, developed in conjunction with the PHC nursing staff, is comprehensive and includes educational material for nursing staff, written practice guidelines and protocols, written educational support, select oral hygiene products, and weekly support by a staff dental hygienist. The outcomes or measured benefits of this program had not been evaluated from a clinical or psychosocial aspect. This thesis evaluated the efficacy of a comprehensive daily oral hygiene program using a randomized controlled clinical trial design.
Chapter 2: Literature Review

2.1 Long-Term Care

Until recently LTC in British Columbia has been divided into assisted living, intermediate care and extended care, but is currently in transition. Individuals who have lost their ability to perform some instrumental activities of daily living (IADL) such as money management, telephone communication, medication management, meal preparation, grocery shopping, housekeeping, laundry, and transportation, required for independent living, qualify for placement in LTC (Miller 1995).

Assessment for admission to which type of LTC facility is based on the ability of an individual to perform activities of daily living (ADL), such as grooming, bathing, dressing, eating, elimination and mobility (Miller 1995). Placement is determined by the level of care required with ADL and the number of nursing hours needed to provide that care.

Table 1. Functional Assessment Tools: IADL and ADL

<table>
<thead>
<tr>
<th>Instrumental Activities of Daily Living</th>
<th>Activities of Daily Living</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Management</td>
<td>Grooming</td>
</tr>
<tr>
<td>Transportation</td>
<td>Bathing</td>
</tr>
<tr>
<td>Communication</td>
<td>Dressing</td>
</tr>
<tr>
<td>Medication Management</td>
<td>Eating &amp; Swallowing</td>
</tr>
<tr>
<td>Grocery Shopping</td>
<td>Elimination/Continence</td>
</tr>
<tr>
<td>Meal Preparation</td>
<td>Mobility</td>
</tr>
<tr>
<td>Housekeeping &amp; Laundry</td>
<td></td>
</tr>
</tbody>
</table>
Assisted living facilities are single-family homes or group homes that can accommodate 1-6 residents, or apartment style buildings that can house multiple residents. Residents of these facilities can perform many of their ADL. These facilities offer assistance on an “as needed” basis. These facilities do not provide direct medical supervision and may or may not have a registered nurse on site, however there is a 24-hour emergency response system in place.

Intermediate care facilities provide full-time nursing supervision and care as well as recreational and rehabilitation services. Residents of these facilities have a reduced capacity to perform ADL or have been assessed as a risk to themselves or others if they were living alone in the community. Special care units are often set up as separate areas in these facilities to accommodate residents with more severe cognitive impairments or behavioral problems. Palliative care is also be provided by these facilities as needed.

Currently in British Columbia the designation of LTC facilities is in transition. Previously the assisted living facilities were not licensed or formally regulated, and intermediate care facilities were licensed under the Community Care Act (1996). At present both assisted living and intermediate care facilities are licensed under the Community Care and Assisted Living Act (2004) and will eventually be considered as “Assisted Living” facilities. These facilities can be either publicly or privately owned and be for-profit or non-profit.
Extended care facilities are regulated and licensed under the *Hospital Act (1979)* and are often associated with an acute care hospital. The facilities can be private or publicly owned and operate as non-profit or for-profit. Full-time nursing care, medical supervision, rehabilitation and recreational services as well as palliative care are provided at these sites. Residents of extended care facilities need assistance for most of their ADL. Their complex medical needs and conditions directly impact their ability to care for themselves or direct others to care for them. In the future these facilities will most likely be known as “Complex Care” facilities.

**Figure 1. Current Placement in LTC in British Columbia**

- Loss of IADL
  - Qualifies for placement in LTC
- Assisted Living
  - Receives assistance for ADL as needed
- Intermediate Care
  - Requires assistance for some ADL and Nursing supervision
- Extended Care
  - Requires assistance for most ADL and Nursing/Medical supervision
2.2 Oral Health Status of Residents Living in Long-Term Care Facilities

Good oral health has been shown to have a positive affect on overall health including the cardio/pulmonary system, nutrition and blood glucose levels (Loesche et al. 1995, Norlen et al. 1991). Unfortunately for the residents of LTC facilities, oral health is poor especially among the elderly and cognitively impaired (Kossioni & Kardazis 1999). This group of individuals reveals an increased incidence of oral diseases such as caries, periodontal diseases and mucosal disorders (Wyatt 2002b, Hawkins 1998, Papapanou et al. 1988 Miyazaki et al. 1992). This increase in oral diseases coupled with multiple medical conditions, poly-pharmacy, decreased immunity and nutritional deficiencies puts this population at risk for poor overall health and a decrease in quality of life.

Poor oral health of residents in LTC facilities can be attributed to poor oral hygiene that results from the accumulation of bacterial plaque, lack of daily mouth care, and lack of professional care. Bacterial plaque forms in the mouths of all individuals, however it appears to form more rapidly in older adults (Holm-Pederson et al. 1992). Caregivers are typically responsible for monitoring and performing daily mouth care, but often consider it a low priority (Weeks and Fiske 1994, Kambu et al. 1993). This ultimately leads to its infrequency and greater accumulation of bacterial plaque. Lack of professional dental care for this population is a result of a limited number of dental professionals trained to practice in LTC facilities, a reluctance of dentists to provide services outside of the traditional private practice setting, limited
funds of the residents, and a perceived lack of need by the residents, their families and nursing staff (Dolan & Atchison 1993, MacEntee et al. 1997).

2.3 Dental Caries

The incidence of dental caries among older residents of LTC facilities has been found to be greater than that of community dwelling older adults (Weyant et al. 1993, Stockwell 1987). A recent study of 369 elderly dentate residents living in intermediate and extended care facilities showed that 78.6% of the residents had at least one carious lesion and on average had 3.79 carious lesions (Wyatt 2002 b). Coronal caries was present in 50.4% of study participants while root caries was found in 68.8% of study participants. The high incidence of dental caries among the older residents of LTC facilities is multifaceted. In part the high incidence is due to the increased number of natural teeth residents are retaining in their older age (Peltola et al. 2004). These retained natural teeth have restorations and prosthesis making them susceptible to recurrent dental caries (Beck et al. 1985). Also there can be an increase in the number of exposed root surfaces from a lifetime of periodontal attachment loss increasing the susceptibility of these retained natural teeth to root caries (Shay & Ship 1995).

Physical impairments such as arthritis, muscle weakness, and decreased mobility from stroke, may impede a resident’s ability to perform their own daily mouth care resulting in an increase in bacterial plaque retained on the teeth (Berkey & Berg 2001). These residents must then rely on caregivers to perform their daily mouth
care but there is a low priority placed on it compared to other tasks during the day (Kambu et al. 1993).

Due to chewing and swallowing difficulties experienced by some residents (Sonies et al. 1984, Hughes et al. 1987), diets can be high in soft fermentable carbohydrates which are not cleared readily from the mouth and can provide a large nutrient reservoir for bacterial plaque. Acid produced as bacteria digest carbohydrates is diluted and buffered by saliva, but older adults often take medications that reduce or alter salivary gland function such as antihypertensives, anticholinergics, antidepressants, diuretics, and anxiolytics (Shay & Ship 1995) reducing the amount of saliva available to buffer these acids. Decalcification that these acids produce can be remineralized with fluoride from toothpaste, mouth rinses or gels but if these products are not being used, decalcification may continue and result in carious lesions.

### 2.4 Periodontal Diseases

A reclassification system of periodontal diseases and conditions has identified many types of diseases that affect the supporting structures of the teeth (Armitage 1999). These diseases range from a mild, localized form of gingival inflammation to aggressive forms of disease in which there is rapid loss of bone and supporting connective tissue of the gingiva. Periodontal diseases can be classified as either plaque induced or non-plaque related with the latter being associated with systemic factors, medications and malnutrition (Armitage 1999). The most common cause of
Periodontal diseases is the accumulation of dental plaque (Loe et al. 1965). Undisturbed dental plaque and its byproducts have been shown to cause inflammatory changes in gingival tissue in as little as 2-4 days (Loe et al. 1965). If dental plaque is not removed, the gingival inflammation can progress to the more destructive form of periodontal disease, periodontitis, in which there is loss of attachment of periodontal structures to the teeth. Good plaque control by the individual and professional debridement of the teeth and root surfaces on a regular basis is an important mechanism to manage this disease (Berkey 1992).

Periodontal diseases can cause gingival bleeding, tooth mobility, tooth loss and halitosis (Shay 1995). These problems affect individuals both physically and psychologically. Tooth mobility and tooth loss can impair chewing and swallowing ability ultimately affecting food choices and nutrition (Heath 1972). For many people eating is an enjoyable, social activity but this will be negatively affected if food choice and consistency is limited. If individuals are self-conscious or embarrassed about the type of food they eat, their altered appearance from tooth loss, or awareness of halitosis, they may withdraw and refrain from social activities. This can be an extremely important issue for residents of LTC facilities because social activity can reduce feelings of boredom, loneliness, and helplessness (Thomas 1996).

The impact of periodontal disease has been shown to go beyond the oral cavity. Correlations have been identified between periodontal bacteria and cardiovascular disease, (DeStefano et al. 1993), diabetes (Schlossman et al. 1990), pneumonia
(Muder 1998) and bacteremia (Sconyers 1973). Many elderly residents of LTC facilities suffer from or are susceptible to these systemic diseases, so it is even more imperative that these bacteria be kept to a minimum with good daily mouth care and regular professional care.

2.5 Denture Stomatitis

Denture stomatitis is often a result of infection under a partial or complete denture caused by the fungus *Candida albicans* (Stenderup 1990). Although other species of *Candida* inhabit the oral cavity, *Candida albicans* is the type most commonly cultivated from this infection (Budtz-Jorgensen 1974). *Candida* species are commensal flora of the oral cavity in approximately 35% of healthy adults and approximately 55% of hospitalized adults (Stenderup 1990). These fungi usually live in balance with other flora but when conditions change they increase in numbers often causing infection. Changes that have been found to shift the carrier state to an infectious state are use of broad spectrum antibiotics or corticosteroid inhalers, poor denture hygiene, long term wearing of dentures (Schou *et al.* 1987), reduction of saliva (Beighton *et al.* 1991), compromised immunity and systemic diseases such as diabetes, HIV and leukemia (Heimdahl 1990). This condition is often asymptomatic but the individual may experience tingling, burning pain, or taste disturbances (Budzt-Jorgensen 1978).

Denture stomatitis is a superficial fungal infection that can become systemic if not treated. Common treatment is topical application of an antifungal agent such as
Nystatin to both the tissue and denture surface. Daily mechanical cleaning of the denture surface is imperative to control and prevent the infection. Denture cleansers have been shown to have a 99% bacterial kill (Shay 2000) but do not have antifungal properties so it has been suggested the best way to store dentures overnight is dry which will prevent the yeast from growing (Stafford et al. 1986). Chlorhexidine has been shown to be effective against *Candida* species and daily rinsing may be a good preventative measure for individuals most susceptible to the infection (Budtz-Jørgensen & Loe 1972) such as the institutionalized elderly.

2.6 Oral Hygiene Education in Long-Term Care Facilities

In an effort to improve the oral hygiene of residents of LTC facilities, educational interventions have been designed for caregivers, since they commonly report a lack of knowledge and training in the provision of daily mouth care (Rak 1990, Adams 1996, Eadie 1992, Chalmers 1996). These educational interventions often address the importance of oral hygiene to oral health, oral health to overall health, etiology and pathogenesis of oral diseases, brushing and denture care techniques, and specialized care for those who are cognitively impaired, unconscious or who have a dry mouth (Simons *et al.* 2000, Isaksson *et al.* 2000, Frenkel *et al.* 2001&2002).

Isaksson *et al.* (2000) found that a single 4 hour educational session for caregivers produced a significant improvement in oral mucosal color, plaque levels and mucosal inflammation for residents of 6 LTC facilities 3-4 months following the education
intervention. Authors of this study recommended that a similar intervention be studied for a longer period of time to see if the improvement could be sustained.

In a longer study of 6 months Frenkel et al. 2001 found that after oral health care education there was a sustained decrease in denture and tooth plaque as well as denture stomatitis and gingivitis for residents of 22 LTC facilities. The authors of this study state that although the improvement in the resident’s oral hygiene was still short of ideal, this educational intervention along with the provision of toothbrushes was a cost effective way of improving the caregivers’ oral health care performance for LTC residents.

In 2002, Frenkel et al. found that after oral health education intervention there was an increase in knowledge and attitudes of caregivers about the provision of oral care. From the survey information gathered from 369 caregivers the most common complaint noted was the lack of oral hygiene products supplied by facilities management. A recommendation from this study was that in order for mouth care to be performed, the necessary oral hygiene aids needed to be available to the residents (Frenkel 2002). The least popular part of the education intervention in this study was brushing simulation on mannequin heads. The investigators chose a mannequin head because a previous pilot study found caregivers reluctant to brush each others teeth.

In a 12 month study, Simons et al. (2000) found that a 90 minute oral health education session in which caregivers were shown how to care for the mouth and
given an opportunity to provide mouth care to each other did not improve the oral health of the residents after one year as measured by denture hygiene status, the Plaque Index and the Gingival Index. Pre and post test questionnaires found that there was an increase in the caregiver’s knowledge and they reported enjoying the training program, but no perceived change in oral care practice of the staff was reported by the residents. In addition to the education training program the participants also received a training manual, samples of oral hygiene aids, information leaflets about the aids, and a list of places where they could obtain them.

Budtz-Jorgensen et al. (2000) implemented an oral health program that included professional dental treatment, education for the caregivers and on-going professional support as well as the provision of toothbrushes and fluoride toothpaste. After 18 months they found that the program was effective in improving the health of the oral mucosa by reducing *Candida* colonization of the oral mucosa and dentures of residents. Debris on dentures, debris on teeth and gingivitis were not measured as part of this study.

The development of an oral care program as opposed to an educational intervention alone was also trialed by Charteris and Kinsella (2001) for residents of a neuro-disability hospital. Their program not only provided education to the caregivers, but also provided written hospital oral care guidelines. This study also appointed an “Oral Care Link Nurse” (OCLN). The OCLN was an “unqualified nursing auxiliary” trained by the dental team in oral hygiene importance and
procedures to be a resource person for other caregivers on that floor, and be responsible for documenting each resident’s daily oral care. The OCLN liaised with nursing and dentistry and met with the dental hygienist and dental manager every 6 weeks to review care and address oral hygiene issues. Regular audits were done by the dental hygienist to monitor the oral hygiene of the residents. After the implementation of the program, oral hygiene was found to improve dramatically with 95% of the residents having a satisfactory or better level of oral hygiene. This study found that there was a high turnover rate for the OCLN and that in the future this person would need to be an integral part of the dental team who received more recognition for their role through constructive feedback and support from the dental team and possibly an increase in salary.

MacEntee et al. (unpublished 2005) studied whether a nurse educator of a facility that acted as the oral health “champion” would have an impact on oral health, body mass and malnutrition. This study was conducted in 14 long-term care facilities. A dental hygienist provided the initial educational in-service training session for facility caregivers. One nurse educator at the facility then became the oral health “champion” with the responsibility of continuing with the future in-services. The nurse educator also acted as a resource person in regards to oral hygiene. The control for this study was the same in-service given by a dental hygienist to the caregivers but no nurse educator was appointed as an oral health “champion”. After 3 months there was no difference in outcomes of oral health status as measured by debris and bleeding indices, body mass or malnutrition both within and between the two groups.
Interviews of the caregivers at all facilities revealed that they preferred to learn through practical experience and that they did not value the nurse educator's influence as an oral health champion.

Sumi et al. (2002) developed a different type of oral care program which did not include formal oral hygiene education other than instruction on how to perform a systematic oral care program. This program used an antimicrobial mouth rinse that was used for swabbing and rinsing by the resident, as well as an electric tooth brush and tongue brush. After 8 weeks both plaque and gingivitis scores were significantly reduced and the residents felt their mouths were cleaner. Caregivers reported that this oral care program reduced their burden and fatigue as compared to providing oral hygiene care with a manual tooth brush. The authors of this study felt that the use of a systematic oral care program once a day is an effective way of improving the oral hygiene of residents of LTC facilities and helps caregivers decrease their workload burden since the program takes less than five minutes per day.

The most comprehensive mouth care program to date was developed by Wener et al. (2003). The program was implemented in a 500 bed LTC facility in Winnipeg, Manitoba, and was based on assessment, planning, implementation and evaluation. The authors first met with management, medical, dental and nursing staff of the facility to assess their concerns regarding oral hygiene needs of the residents. From there they planned both oral hygiene presentations and hands-on educational sessions for any caregivers who could attend. One of the educational sessions was video taped
so that caregivers who could not attend any of the 3 presentations could still view the video at their convenience. Information pamphlets were designed for all caregivers to take away from the educational sessions as well as sample products. Written practice guidelines and protocols were developed and presented to caregivers as well. Mouth care products that were appropriate for the institutionalized adult were supplied to the residents of the facility. Following the work of Charteris and Kinsella in 2002, with the Oral Link Care Nurse, this group held sessions for a core group of interested caregivers who would be specially trained in oral hygiene procedures to become peer mouth care trainers. This program was not formally tested to measure improvement in the oral hygiene of the residents but the authors did note that it created a “buzz” about mouth care at the facility. Today the peer trainers continue to educate and support the caregivers, appropriate mouth care products are available in the gift shop, oral health policies include a quarterly oral screening by the unit coordinators, and referrals to the dental clinic have increased. Residents who present to their dental appointments with poor oral hygiene are followed up by one of the dental hygienists who provide informal on-unit training, a service that caregivers welcome.

A questionnaire was used as a pre and post assessment tool for the in-service program but unfortunately only 11 of the 60 registrants of the program completed both questionnaires and 1/3 of them were completed by speech pathologists who do not provide mouth care. Some trends were noted from the responses but could not be generalized to the general population of the caregivers.
2.7 UBC-PHC Comprehensive Daily Mouth Care Program

In January 2002 the UBC Geriatric Dentistry Program formed a partnership with the 7 Providence Health Care Residential sites. Within this partnership the Geriatric Dentistry Program was responsible for providing oral health assessments and treatment to all residents. Another aspect of this partnership was the agreement that the dentistry program would provide mouth care education to all nursing staff (nurses and care aides) at the sites. A dental hygienist was hired as an “Oral Hygiene Educator” to provide this education. Through the assessment phase of the education it became very clear that what was needed was a program not just an educational intervention. As with the Healthy Mouth-Healthy Body program (Wener et al. 2003) this program was developed and based on assessment, planning, implementation and evaluation. The following is a description of the UBC-PHC Comprehensive Daily Mouth Care Program that came out of this partnership and how it was developed.

Assessment Phase

The first step in the development of this program was an assessment of the facilities by the dental hygienist that included an interview with each Director of Care and some of the nursing staff as well as observation within the facilities. The information gained from this assessment included demographic information about the staff and residents, prior mouth care education at each facility, prior dental professional involvement at each facility and current daily mouth care protocols. It was also important to ascertain what the facility hoped to gain from a program and to identify any barriers that might impede the implementation of a daily mouth care program.
The demographic data of the residents such as the age and functional level needed to be taken into consideration so that education material chosen would be applicable to the population. All sites had older adults (65-100+yrs), were either intermediate or extended care facilities and had a percentage of residents with special needs such as cognitive impairments, dry mouth and swallowing difficulties. Educational material developed by the “ELDERS” group at the University of British Columbia (Wyatt et al. 2001) was used as a basis for a 45 minute theoretical in-service session on the importance of oral health, etiology of oral diseases, routine and specialized oral care techniques and a dental professional referral system. A manual that contained both the images from the in-service material as well as the script was also available so staff could read it at their convenience.

The number and turn-over rate of the staff was also taken into consideration as they would influence the amount and frequency of education intervention. Management indicated that turn-over rate of staff at these facilities was low. Most sites reported having very little contact with dental professionals in the past and their prior mouth care education was minimal with the exception of one site that participated in a recent daily mouth care education pilot project (MacEntee unpublished 2005).

Some of the most important information obtained during the assessment phase came from observation of the caregivers at each facility. Many residents did not have the mouth care products necessary for their daily mouth care, some products were ineffective
or contraindicated such as toothettes and mouth rinses with alcohol. There was no system for replenishing or replacing old products. Some residents did not have family or friends to purchase mouth care products. It became apparent that this program would fail like others had in the past unless the caregivers and residents had the individualized products required to perform the daily mouth care procedures. Cross contamination was also a concern because many mouth care products in rooms shared by four residents were being stored unlabelled at a single sink.

Another important observation was that there was no written material for staff to refer to in regards to the provision of mouth care procedures with the exception of one chapter in a nursing textbook (Perry and Potter 2002). These texts were often stored in an office and not available to staff at all times. Formal guidelines and protocols were not in place so staff didn’t have a clear idea of what was expected of them in regards to the provision of daily mouth care.

The most common request from each facility was to have nursing staff better educated on the importance of daily mouth care with emphasis on how poor oral health affected overall health. Hands-on training for uncooperative residents was also requested. They felt that the biggest barrier regarding staff acceptance of a program was going to be their perceived lack of time to perform daily mouth care procedures. Cost of mouth care products was also indicated as a possible problem.
Planning Phase

From the information gathered during the assessment phase, a general plan for the facilities was developed by the dental hygienist, including the type of education and the materials that would be necessary to implement the program. Each facility also received an individual plan for education, and special areas of focus. At this point it was necessary to work with a nursing task group to develop daily mouth care guidelines and protocols. This collaborative approach between Nursing and Dentistry to the development of the program was essential because each group has unique areas of expertise. Since the ultimate goal of the program was to improve oral hygiene and change nursing practice, both disciplines input into the development of such a program ensured that recommendations would be evidence based in dentistry and feasible from a nursing standpoint. This collaborative approach also ensured there would be nursing support which would be essential to the success of implementing change.

The guidelines and protocols were developed by a Clinical Nurse Educator, a Clinical Nurse Specialist, two Clinical Nurse Leaders, a Dental Hygienist and a Prosthodontist. The format of the guidelines and protocols followed that of Providence Health Care and reflected the philosophy of the organization and the educational material content. Daily mouth care protocols being used in other LTC facilities were gathered and evaluated by the group. These protocols were then adapted to coincide with the education material content being used, such as dry denture storage. The group met bi-monthly for approximately one year to fully develop the final practice guidelines and protocols. During this time new oral care products were chosen by the dental hygienist to be
standardized and provided across all sites. In choosing the oral care products a review of the literature was conducted to ascertain the specifications that would best suit this population. Those specifications were then submitted to the purchasing department of Providence Health Care for price and product comparison.

Figure 2. Oral care products used with the UBC-PHC Daily Mouth Care Program

<table>
<thead>
<tr>
<th>Products for Daily Mouth Care Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Oral-B Antibacterial mouth rinse without alcohol (Gillette Canada)</td>
</tr>
<tr>
<td>2. Crest Anti-cavity toothpaste (Proctor &amp; Gamble Inc.)</td>
</tr>
<tr>
<td>3. Butler 409CI toothbrush (Sunstar Butler)</td>
</tr>
<tr>
<td>4. Butler denture brush (Sunstar Butler)</td>
</tr>
<tr>
<td>5. Plastic denture cup</td>
</tr>
<tr>
<td>6. Oral-B proxabrush handles and 614 tapered refills (Gillette Canada)</td>
</tr>
<tr>
<td>7. Waxed mint dental floss (Johnson &amp; Johnson)</td>
</tr>
<tr>
<td>8. Water based lubricant (Fougera &amp; Co)</td>
</tr>
<tr>
<td>9. Reusable foam mouth prop with handle (Specialized Mouth Care Co.)</td>
</tr>
</tbody>
</table>

It was estimated that it would cost approximately $5.00-$6.00 per resident, per year to provide these products taking into account the proportion of residents with teeth and/or dentures as well as turn-over rates of the residents. Site operation leaders of each facility were consulted and it was agreed that the cost of the products would be covered in the general operating budget of the facilities.

The Adult Care Regulations stipulate that any person residing in a LTC facility for more than 2 weeks must have an individualized care plan for their oral health (BC Reg 329/97). Taking this into consideration standardized mouth care cards and a nursing oral assessment were developed. A nursing oral assessment document that had been used at
another LTC facility was adapted to suit the needs of the facilities. This assessment was to be completed by the nurse upon admission of a resident to the facility and then yearly prior to that resident’s annual care conference. The mouth care cards were to be placed with the Activities of Daily Living (ADL) wall chart of each resident. The card contained the list of supplies required for the resident, their mouth care protocol and an area for special instructions. The purpose of the cards was to aid nursing staff in identifying the type of mouth care the resident required and was especially helpful for casual staff who were unfamiliar with the resident. The cards were divided into conscious and unconscious residents, and then sub-divided into resident with teeth, without teeth and unable to swallow. Specialized cards for mouth sores, inflammation, dry mouth and bleeding gums were also available to be posted on the ADL chart if caregivers noticed residents were experiencing those problems.

Implementation

During the 9 months that the practice guidelines and protocols were being developed, the dental hygienist provided at least 2 educational sessions to each of the seven facilities. The knowledge portion of the education was given by either, flip-chart, overheads or Power Point presentation. There was also a hands-on portion for oral screening, tooth brushing technique and denture care. This hands-on education was done with a resident of the facility. After all sites had received this education, at least one educational session was conducted at each facility on special needs of residents such as those who are uncooperative, have a dry mouth, are unconscious and those who have swallowing difficulties. The caregivers chose the residents for these hands-on sessions so they and
the dental hygienist as a group could problem solve through some of the difficulties they were having with providing mouth care for that resident.

After all the educational sessions were completed, the mouth care products in Figure 2 were displayed at each facility. A dental assistant or dental hygienist was present to show the staff the new products that were going to be available and answer any questions. The most common question was regarding the elimination of the toothettes from the product inventory, a stick with a foam sponge on the end used for swabbing out the mouth. Toothettes have been shown in the literature to be far less effective than a toothbrush at removing plaque and could be dangerous if the resident were to bite off a piece of the foam and aspirate it (Pearson & Hutton 2002). It become apparent from the number of questions that we received about the toothettes, that more education would be needed on how to use the toothbrush or gauze instead of the toothettes to clean a resident’s mouth. In-service sessions were then provided at each site at least once to review the new products, demonstrate their use and to answer questions from the staff.

The practice guidelines and protocols were finished and ready for in-service by the end of the first year. Since these were nursing practice guidelines and protocols it was decided that the Clinical Nurse Specialist or Clinical Nurse Educator would provide the education of the document focusing on the roles and expectations of each staff member as well as some of the changes to their current daily mouth care protocols. Mouth care cards were then posted on the ADL wall chart for each resident.
Family and friends of the residents play an important role in their overall care. It was important to inform them of the daily mouth care program. The dental hygienist and Clinical Nurse Specialist attended a Family Council meeting at each facility to explain the program including a presentation of the mouth care products that were now provided for the residents at the facility and how to use them. A pamphlet was developed for family and friends on the importance of daily mouth care procedures and instruction on how they can be performed. This pamphlet was designed in the hope that family and friends would take an active role in helping provide the residents with their mouth care while visiting.

The last aspects of the program to be implemented and in-serviced were denture labelling and the nursing oral assessment. Unit clerks received the hands-on training on how to label dentures as they were the person designated at each facility to provide the service. Each facility received 2 nursing oral assessment in-services by Power Point. The nursing oral assessment is designed to identify any abnormal oral conditions that require monitoring and/or referral to a dental professional. The assessment also provides the information the nurse needs to develop an individualized mouth care plan for the resident. The feedback received from the nurses in regard to the document was not positive and work on a new document began immediately. In developing this new document and in-service material a prosthodontist and oral medicine specialist were consulted. The feedback and expert advice resulted in a much improved document that was less repetitious, easier to understand, quick to complete, and more pertinent to the information the nurses were trying to ascertain from the assessment.
A dental hygienist educator was responsible for the mouth care education. The task of educating new staff and providing refresher in-services proved to be daunting and it became clear that additional educational material that did not require the dental hygienist to present would be beneficial. Funding was obtained by a grant from the Wah Leung Foundation to transform the educational presentation into an interactive CD-Rom, which was later converted into DVD and VHS format so that new staff could view the information on their own, and would only require the dental hygienist to be there for hands-on training and clarification of the educational material. This format for education was appreciated by the staff. This also freed up a lot of the dental hygienist’s time so she could focus on more one to one, hands-on training with the staff and residents.

**Evaluation Phase**

Two formal evaluations were carried out at the facilities; the first being a bi-yearly audit of the mouth care program conducted by the dental hygienist, and the other being a nursing staff satisfaction survey of the program. The audits were designed as a way to monitor the progress of the program, guide future education and provide a mechanism for both positive and negative feedback in regards to the mouth care being provided. The dental hygienist assessed each resident’s room for the presence of a mouth care card, mouth care products, storage of the products, and labelling of the products. As it would be too difficult to do an oral exam for over 800 residents, another way of auditing whether or not mouth care had been performed was devised. All residents had
toothbrushes and/or denture brushes for their mouth care so it was decided that if the brush was moist that it was a good indication mouth care had been performed within a couple of hours. All audits were done during lunch as it was reasonable to expect that mouth care would have been completed by that time of the day for a large portion of the residents. This did not measure the effectiveness of the mouth care being performed which would be valuable information, but it did give a good indication of how much mouth care was being performed and which residents were receiving it. After each audit the dental hygienist would meet with the leaders of all sites and present the overall findings, make recommendations on how to improve on the results as well as set out the schedule of future education based on the findings of the audit. The dental hygienist then met with each site to discuss their individual findings. It was important to present both the positive and negative as well as reward those floors that were doing the best job. A small, $50.00 prize such as a toaster oven or gift basket was given to the floor with the best score, which has now become a small incentive to improve daily mouth care.

The staff satisfaction survey developed by the Geriatric Dental Program and conducted by Providence Health Care at the end of the 2 years was to ascertain from the nursing staff what they liked and didn’t like about the mouth care program (Providence Health Care, The Centre for Aging and Health 2004). They were also given the opportunity to make suggestions on how to improve the program so that it better met their needs. The overall response for the program was positive. The aspect of the program that they liked the most was the availability and provision of the mouth care products (87.4%). The areas that they wanted to see improvement in were the availability
of more mouth care instructional material, more access to the dental hygienist and more in-services and hands-on training especially with the more cognitively impaired residents.

All information gathered in the evaluation phase was invaluable to improve the program. The program has proven to be a work in progress with both disciplines of Nursing and Dentistry working collaboratively to best meet the needs of the residents.

**Conclusion**

The development and implementation of a Comprehensive Daily Mouth Care Program in the Providence Health Care Residential Care Facilities has been one of many attempts to improve the oral health of residents living in LTC facilities. This program tried to expand on earlier educational interventions taking into consideration recommendations made such as provision of products, written support, regular dental professional support, and on-going evaluation. To date this program has been in place for approximately 2 years and is continuing to be improved with both dental and nursing input.
2.7.1 Modifications to the UBC-PHC Comprehensive Daily Mouth Care Program

Originally mouth care was divided into conscious and unconscious resident, and then sub-divided into resident with teeth, without teeth or unable to swallow. These divisions were changed to better reflect what residents would have had in their mouth such as teeth, dentures or teeth and dentures. Both the algorithms and mouth care cards were changed to reflect this. A diagram of a tooth, denture or both was placed on each card that would help staff recognize what the resident had in their mouth. The cards remained color coded, but the full protocol was removed and only 2-3 simplified instructions were written on each card. Since the mouth care protocol for unconscious residents and those unable to swallow was almost identical they were placed on one card together. Mouth care algorithms which were normally posted throughout the facility for staff to refer to were instead placed within a daily mouth care binder that was kept at each nursing station. This binder was a new addition to the program and contained a copy of the educational material, the practice guidelines and protocols (Appendix 1), algorithms for routine and specialized care (Appendix 2, 3 & 4), the list of mouth care products (Appendix 5), a product inventory checklist, nursing oral assessment forms (Appendix 6) and extra mouth care cards (Appendix 7). The binder provided a single source that staff could access if they had any questions or concerns had regarding mouth care.
2.8 Summary of the Literature

In reviewing the literature it is apparent that residents of LTC facilities have poor oral hygiene which can result in an increase in dental caries, periodontal disease and oral mucosal diseases. Although it has been shown that poor oral hygiene can result in poor overall health, the provision of good daily oral hygiene is still lacking in LTC facilities. Studies of caregiver’s knowledge, attitude and behavior towards the provision of daily mouth care indicate that a lack of knowledge may be one of the reasons for it being not performed regularly. Recently investigators have developed a range of educational interventions for the caregivers of LTC facilities. It appears that for an educational intervention to be successful it not only needs to improve knowledge and skill, but also needs to affect attitude in order to change behavior. Taking into consideration the results and recommendations of the investigators I believe that a comprehensive daily mouth care program would best accomplish the goal of improving the oral hygiene of residents of LTC facilities. A comprehensive program similar to that of Wener et al. (2003) and the UBC-PHC program which works with nursing staff and stakeholders of the facility to develop a daily mouth care program may be the key to the long-term improvement in knowledge, attitude and behavior of caregivers towards the provision of daily mouth care.
2.9 Objective

This randomized, controlled clinical trial involving 2 long-term care facilities was designed to test whether a comprehensive daily mouth care program for LTC facilities could reduce gingivitis, denture stomatitis and debris on teeth and dentures. A questionnaire was also used to assess an improvement in knowledge, behaviour and attitudes of nursing staff with respect to the provision of daily mouth care.
Chapter 3: Materials and Methods

3.1 LTC Facilities Participating in the Study

Two LTC facilities in Vancouver, Braddan Private Hospital and Point Grey Private Hospital, were invited to participate in this study. Both facilities were private, for-profit hospitals that were owned and managed by one person. One facility, Braddan, was randomly allocated to receive the comprehensive daily mouth care program while the other, Point Grey, received no intervention and acted as a negative control. Written consent was obtained from the owner of the facilities (Appendix 8) to conduct the study over a 6 month period. The test site would receive the comprehensive daily mouth care program with the control site received no education until the end of the study. Upon completion of the study the control site received 2 daily mouth care educational inservices. Ethical approval for the study was obtained from the University of British Columbia Behavioural Research Ethics Board in February 2004 (B03-0853).

3.2 Daily Mouth Care Assessment

At the test site a facility assessment for daily mouth care practices and products was conducted and included an interview with the owner/administrator and head nurse to discuss current daily mouth care procedures, identify barriers to the provision of daily mouth care and goals they had for the program. An inspection of all resident’s rooms was conducted to assess current products being used, their condition and storage.
From the information gathered during the facility assessment a written report summarizing existing daily mouth care practices and education was prepared. (Appendix 9).

This report outlined recommendations for mouth care products, daily mouth care protocols and staff education. The report was given to the administrator and head nurse for review. A meeting was set up one week later to discuss the report recommendations and to develop mouth care guidelines and protocols specific to their facility. Oral care products were selected and purchased or received by donation including soft toothbrushes, denture brushes, fluoride toothpaste, denture cups, anti-bacterial/fluoride mouthrinse, oral lubricants, and mouth props.

3.3 Nursing Staff Participants: Questionnaire

Prior to the implementation of the program, care aides and nurses at both Braddan and Point Grey sites were asked to complete a questionnaire to assess their knowledge of oral health needs for older adults, current mouth care procedures and attitudes about the provision of mouth care. (Appendix 10) Each participant was asked to choose a code instead of their name for the questionnaire to ensure anonymity. Completion of the questionnaire was considered consent from staff members to participate in this study. The questionnaire contained 18 true/false questions to test knowledge, 4 Lickert Scale questions to assess attitude, and 2 questions regarding the time spent performing daily mouth care for each resident and any barriers they face in providing that care were designed to assess behaviour. Participants were also asked how many residents they
cared for on each shift and their position at the facility (care aide or nurse). A comments area was also provided for participants to provide any additional input. The questionnaire was completed again by participants at the end of the study to measure any changes in attitude, behaviour and knowledge related to daily mouth care. Prior to administering the questionnaire, it was field tested by 7 nursing staff in another LTC.

The questionnaire format and structure was developed in consultation with Dr. Stephan Hansen. The true/false questions were developed to reflect the content of the educational material and the question regarding barriers were the same as those used by the Healthy Mouth-Healthy Body in-service pilot project (Wener et al. 2003).

3.4 Clinical Participants

Written consent to participate in the study was requested from all residents or their appointed healthcare decision makers (Appendix 11). Those residents who were dentate and required antibiotic prophylaxis for probing were excluded from the study. Written consent to participate in the study was obtained from 31/51 residents at Braddan, and 26/51 at Point Grey. All those who consented to participate in the study understood that their mouths would be examined for the presence of debris on teeth and/or dentures as well as gingival inflammation or denture stomatitis by a dentist 3 times over the course of 6 months. They were also informed that there would be no charge for the oral examination nor would they receive any compensation for their participation. Any oral problems identified by the dentist were reported to the resident and/or appointed
healthcare decision maker for follow-up by their dentist of record or a dentist in the community.

### 3.5 Clinical Measurements

Prior to the implementation of the program, baseline data of debris and gingivitis or denture stomatitis was gathered on all resident subjects. Soft debris was assessed using the UBC-Oral Debris Index (UBC-ODI) a modified version of the Simplified Debris Index (DI-S) (Green & Vermillion 1960) a component of the Simplified Oral Hygiene Index (OHI-S) (Greene & Vermillion 1964). The DI-S uses the six Ramfjord teeth (upper right 1st molar, upper left central incisor, upper left 1st premolar, lower left 1st molar, lower right central incisor, and lower right 1st molar) with debris scored on a scale of 0-3. The modification made to the DI-S index was that all teeth in the mouth were scored since not all subjects had the six (6) Ramfjord teeth present (Ramfjord 1967). Debris on dentures was scored as clean or not, depending on the amount of debris visually present on the denture. A denture with debris covering no more than 25% of its surface area was considered to be clean. Denture stomatitis was measured using a three (3) point scale (Newton 1962)

1= Localized simple inflammation or pinpoint hyperemia 2= Erythematous or generalized simple type presenting a more diffuse erythema involving a part or the entire denture-covered mucosa 3= Granular type (inflammatory papillary hyperplasia) commonly involving the central of the hard palate and alveolar ridges, and is often seen in association with Types 1&2.

To assess gingivitis, the UBC Gingival Bleeding Index (UBC-GBI) was used. The examiner used a 2mm graduated manual periodontal probe gently inserted 2mm sub-
gingival at the distal aspect of the tooth and swept towards the mesial. All teeth with bleeding were counted, then divided by the number of teeth and multiplied by 100 to yield the percentage of teeth with gingival bleeding.

All examinations were conducted by the same experienced dentist who practices in LTC settings. The examiner spent four hours prior to the start of the study examining and calibrating with the indices on residents at another LTC facility in Vancouver. Examiner intra-rater reliability was performed during the baseline and four-month examinations. Since plaque and bleeding levels can vary from day to day, this re-examination of 10% of subjects was performed on the same day, with a minimum of 1 hour between examinations and no provision of mouth care between examinations. The Kappa score was found to be 0.51 indicating fair agreement.

3.6 Program Implementation

Following the gathering of the baseline data, the program was implemented. The mouth care guidelines and protocols were posted in a Daily Mouth Care Manual at each nursing station for easy access by the staff. A series of four educational in-service sessions for caregivers were provided by a dental hygienist. The education material “Mouth Care for Persons in Residential Care” developed by the ELDERS group at the University of British Columbia was used and included the importance of oral health, oral diseases, routine tooth brushing and denture care techniques and specialized care for residents who are uncooperative, unable to swallow or who have a dry mouth. These sessions were attended by all nurses and care aides and were intended to provide staff
with a better understanding of the importance of mouth care, a review of the new daily
mouth care guidelines and protocols, as well as hands-on demonstrations of mouth care. The hands-on demonstrations included techniques to be used for independent, dependant, uncooperative and special needs residents. A review of the new mouth care products was also presented in these in-service sessions. The educational material was included in the Daily Mouth Care Manual in written, inter-active CD Rom, DVD and VHS format for any new staff member to view at their convenience.

Two separate in-services were given to nurses on how to perform a nursing oral assessment. These sessions focused on the systematic assessment of the teeth and soft tissues of the mouth, instruction on documentation of findings, development of daily mouth care plans for the residents and referrals to dental professionals.

Denture labelling demonstration was offered to any interested care aides. A family council meeting was attended by the dental hygienist during the month that the educational in-servicing was being done to provide the families of the residents with information about the program and an invitation to help with the daily mouth care of their family member. An information pamphlet, “Mouth Care for Persons in Residential Care. Information for Families and Friends” was distributed at this meeting to assist families with mouth care techniques. (Wyatt et al. 2003)

The dental hygienist made weekly one hour visits to the facility to provide on-going education and to support staff concerning mouth care. Activities during these visits
included answering questions, reviewing basic mouth care techniques and working with the care aides and those residents who they were having difficulty providing mouth care.

Following the end of the educational in-services, an audit was performed by the dental hygienist after 2 and 4 months. The purpose of these audits was to foster accountability in the care aides, and to provide both positive feedback and recommendations for improvement. The use of products, their storage and labeling was assessed. The findings of this audit were reported to the facility administrator and head nurse. (Appendix 12)

3.7 Sample Size Calculation

Sample size calculation was based on a reduction in debris on teeth. A previous study of this population estimated that a 30% reduction in debris on teeth would be clinically beneficial (MacEntee unpublished 2005). The standard deviation was determined from baseline to be 60%. With 80% power the corresponding Z beta is 0.84. At a significance level of 0.05, a two-sided test would achieve an 80% power with 62 subjects (31/group).

3.8 Analysis

The Statistical Package for the Social Sciences (SPSS Inc., Chicago, Ill.) was used to analyze the data. A paired t-test was used to test for significant differences between mean values for debris on teeth, gingivitis and denture stomatitis. Debris on dentures was analyzed by cross-tabulation and Chi-Square test. The questionnaire data was analyzed
by means of frequency tables, cross-tabulation, Wilcoxon Signed-Ranks test and Mann-Whitney U-test. Probability of 0.05 was defined as significant for all statistical tests.
CHAPTER 4: RESULTS

4.1 Study Population

The 2 LTC facilities in this study, Braddan Private Hospital and Point Grey Private Hospital were each 51 bed sites. All residents who did not require antibiotic prophylaxis for periodontal probing were invited to participate in the study. Consent to participate in the study was received from 31 residents at Braddan and 26 at Point Grey. Baseline examinations were completed on 26 residents at Braddan. Two residents asked to be removed from the study prior to examination, one was unable to be examined due to uncooperative behaviour and 2 residents were edentulous and had no dentures. Baseline examinations were completed on 24 residents at Point Grey. Two residents were unable to be examined due to uncooperative behaviour. One (1) month examinations were completed on 25 residents at Braddan and 20 at Point Grey. During the course of the study 2 residents at Braddan and 5 at Point Grey died. One resident from Point Grey moved during the study. Twenty-four (24) residents from Braddan and 19 from Point Grey were available for all 3 examination intervals and were included in the final analysis.

The age of residents included in this study at Braddan ranged from 50-100 years, with a mean age of 86.11 years (SD 9.88). At Point Grey the residents ranged in age from 52-93 with a mean age of 79.97 (SD). Male and female ratios for Braddan and Point Grey were M=7/F=17, M=9/F=10 respectively. Thirteen (13) residents of Braddan had teeth, 5 had partial dentures, and 11 had full dentures. For those residents who had partial or full dentures 15 were maxillary and 11 were mandibular. At Point Grey 17 residents had
tooth, 3 had partial dentures and 1 had full dentures. For those residents with partial or full dentures 3 were maxillary and 3 were mandibular.

**Figure 3:** Age of resident participants for Braddan & Point Grey

![Age Distribution Graph](image)

**Figure 4.** Dentate/denture status of resident participants for Braddan & Point Grey

![Dentate/Denture Status Graph](image)
4.2 Debris on Teeth

The 13 partially dentate participants of Braddan had a mean UBC-ODI score of 1.90 (SD 0.63) at baseline, 2.22 (SD 0.79) at 1 month, and 2.01 (SD 0.78) at 4 months. The 17 partially dentate participants at Point Grey had a mean debris on teeth of 2.05 (SD 0.60) at baseline, 2.05 (SD 0.60) at 1 month, and 2.02 (SD 0.62) at 4 months. No statistically significant difference in mean debris on teeth was seen at 1 or 4 months at either facility. (Table 2)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>1 month</th>
<th>4 month</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>1.90</td>
<td>2.22</td>
<td>2.01</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>0.63</td>
<td>0.79</td>
<td>0.78</td>
</tr>
<tr>
<td><strong>Braddan</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Point Grey</strong></td>
<td>2.05</td>
<td>2.05</td>
<td>2.02</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>0.60</td>
<td>0.60</td>
<td>0.62</td>
</tr>
</tbody>
</table>

4.3 Debris on Dentures

At Braddan there were 26 dentures (6 partial and 20 complete) examined for debris; 15 were maxillary and 11 were mandibular. 46.6% of subjects had clean maxillary dentures at baseline, 46.6% at 1 month and 73.3% at 4 months. Clean mandibular dentures were found to be 64.6% at baseline, 64.6% at 1 month, and 81.8% at 4 months. Debris on dentures was reduced in 26% (4) maxillary and 22% (2) mandibular dentures
by the end of the study. These improvements were not statistically significant (p=0.35, p=0.20). (Table 3)

At Point Grey there were 6 dentures (3 partial and 3 complete) examined for debris; 3 were maxillary and 3 mandibular. Clean maxillary dentures were found to be 33.3% at baseline, 33.3% at 1-month and 66.6% at 4 months. Clean mandibular dentures were found to be 0% at baseline, 66.6% at 1 month and 100% at 4 months. Debris on dentures was reduced on 33.3% (1) maxillary and 100% (3) mandibular dentures at 4 months. A decrease in debris on dentures was found for both maxillary and mandibular dentures, but due to the small numbers was not amenable to statistical analysis. (Table 4)

Table 3. Denture cleanliness for Braddan at baseline, 1 & 4 months

<table>
<thead>
<tr>
<th></th>
<th>Baseline (%)</th>
<th>1 month (%)</th>
<th>4 month (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxillary</td>
<td>7</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>n= 15</td>
<td>(46.6)</td>
<td>(46.6)</td>
<td>(73.3)</td>
</tr>
<tr>
<td>Mandibular</td>
<td>7</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>n= 11</td>
<td>(63.6)</td>
<td>(63.6)</td>
<td>(81.8)</td>
</tr>
</tbody>
</table>

* Dentures with less than 25% of their surface covered in debris were considered clean

Table 4. Denture cleanliness for Point Grey at baseline, 1 & 4 months

<table>
<thead>
<tr>
<th></th>
<th>Baseline (%)</th>
<th>1 month (%)</th>
<th>4 month (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxillary</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>n= 3</td>
<td>(33.3)</td>
<td>(33.3)</td>
<td>(66.6)</td>
</tr>
<tr>
<td>Mandibular</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>n= 3</td>
<td>(0.00)</td>
<td>(66.6)</td>
<td>(100)</td>
</tr>
</tbody>
</table>
4.4 Gingivitis

The 13 partially dentate participants of Braddan had a mean UBC-GBI score of 0.03 (SD 0.05) at baseline, 0.03 (SD 0.05) at 1 month and 0.01 (SD 0.02) at 4 months. The 17 partially dentate participants at Point Grey had a mean gingival bleeding score of 0.03 (SD 0.07) at baseline, 0.03 (SD 0.07) at 1 month and 0.05 (SD 0.09) at 4 months. No statistically significant reduction in gingivitis was found at 1 or 4 months at either facility. (Table 5)

Table 5: Gingivitis scores; mean UBC-GBI for Braddan & Point Grey at baseline, 1 & 4 months

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>1 month</th>
<th>4 month</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Braddan</td>
<td>0.03 (0.05)</td>
<td>0.03 (0.05)</td>
<td>0.01 (0.02)</td>
</tr>
<tr>
<td>Point Grey</td>
<td>0.03 (0.07)</td>
<td>0.03 (0.07)</td>
<td>0.05 (0.09)</td>
</tr>
</tbody>
</table>

4.5 Denture Stomatitis

At Braddan, denture stomatitis for the maxilla at baseline was present in 7 (46.6%) arches. These sites were classified as Type I in 6 (40%) and Type II in 1 (6.7%). At 1 month denture stomatitis was present in 7 (46.6%) arches and classified as Type I in 5 (33.3%) and Type II in 2 (13.3%). At 4 months denture stomatitis was present in 3 (20.0%) as Type I in 2 (13.3%), and Type II in 1 (6.7%). Denture stomatitis in the maxilla did not decrease after 1 month but decreased in 4 (26.6%) arches by 4 months and did reach statistical significance (p=0.03). (Table 6)
Table 6. Maxillary denture stomatitis (Newton 1962) for Braddan at baseline, 1 & 4 months

<table>
<thead>
<tr>
<th>Type</th>
<th>Baseline (%)</th>
<th>1 month (%)</th>
<th>4 month (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>n=15</td>
<td>(40.0)</td>
<td>(33.3)</td>
<td>(13.3)</td>
</tr>
<tr>
<td>Type 2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>n=15</td>
<td>(6.7)</td>
<td>(13.3)</td>
<td>(6.7)</td>
</tr>
<tr>
<td>Type 3</td>
<td>n=15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Denture stomatitis for the mandible at baseline was present in 1 (9.1%) arch as Type I. At 1 month denture stomatitis did not change. At 4 months denture stomatitis was present in 2 (18.2) arches as Type II. (Table 7)

Table 7. Mandibular denture stomatitis (Newton 1962) for Braddan at baseline, 1 & 4 months

<table>
<thead>
<tr>
<th>Type</th>
<th>Baseline (%)</th>
<th>1 month (%)</th>
<th>4 month (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>n=11</td>
<td>(9.1)</td>
<td>(9.1)</td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td>n=11</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(18.2)</td>
</tr>
<tr>
<td>Type 3</td>
<td>n=11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At Point Grey denture stomatitis for the maxilla at baseline was present in 2 (66.6) arches as Type I. At 1 month there was present in 2 (66.6) arches as Type I and 1 (33.3) as
Type II. At 4 months was present in 1 (33.3%) as Type II. There was no decrease in maxillary denture stomatitis by 1 month, but a decrease of 1/3 (33.3%) by 4 months but due to the small numbers these findings were not amenable to statistical analysis. (Table 8). No denture stomatitis was noted for any mandibular arch at Point Grey.

Table 8. Maxillary denture stomatitis (Newton 1962) for Point Grey at baseline, 1 & 4 months

<table>
<thead>
<tr>
<th></th>
<th>Baseline (%)</th>
<th>1 month (%)</th>
<th>4 month (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>2 (66.6)</td>
<td>2 (66.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n= 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>n= 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td></td>
<td>(33.3)</td>
<td>(33.3)</td>
</tr>
<tr>
<td></td>
<td>n=3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.6 Questionnaire

All caregivers (RN, LPN and RCA) of Braddan and Point Grey was invited to participate in the pre/post questionnaire. At Braddan 9/40 caregivers (RN=1, RCA=8) completed both questionnaires. At Point Grey 13/40 caregivers (RCA=13) completed both questionnaires.

The average number of residents caregivers cared for on a shift was 10 at both Braddan and Point Grey. At the beginning of the study care aides Braddan were spending on average 4.7 minutes (SD=1.82) providing mouth care to each resident, and at
Point Grey 4.1 minutes (SD=1.26). At the end of the study care aides at Braddan were spending an average of 5.0 minutes (SD=2.83) and at Point Grey 4.1 minutes (SD=1.26).

The true/false questions to test for knowledge of mouth care found that prior to the implementation of the mouth care program the mean number of correct responses from the caregivers at Braddan was 12.3/17 (72%) and at Point Grey 12.5/17 (74%). On the post test the average number of correct responses at Braddan was 11.8 (69%) and Point Grey 11.7 (69%).

Table 9: Frequency of correct responses to T/F questions on pre/post questionnaire for Braddan and Point Grey

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-questionnaire</th>
<th>Post-questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Braddan n=9</td>
<td>Point Grey n=13</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>9</td>
<td>8</td>
</tr>
</tbody>
</table>

Mean 12.3 11.8 12.5 11.7
Barriers noted within the questionnaire to providing mouth care experienced by Braddan prior to the program were: not enough time to do it (n=4), residents not cooperating (n=8), supplies not available (n=2) and residents having bad breath (n=1). One staff member reported experiencing no barriers to providing mouth care. No staff member identified a lack of knowledge in providing mouth care or that it was not a priority where they worked as a barrier. On the post questionnaire staff reported barriers to providing mouth care as: not enough time to do it (n=3), residents not cooperating (n=9) and supplies not available (n=1). (Table 10)

Barriers noted within the questionnaire to providing mouth care experienced by Point Grey prior to the implementation of the program at Braddan were: not enough time to do it (n=8), residents not cooperating (n=12), don't know how to do it (n=1), supplies not available (n=9), residents have bad breath (n=2) and didn’t seem to be a priority where they work (n=1). At the end of the study staff reported barriers to providing mouth care as: not enough time to do it (n=11), residents not cooperating (n=13) and supplies not available (n=11). No staff member on either questionnaire reported not having any barriers to providing mouth care, nor did they experience any barriers not listed.
Table 10: Response rate of caregivers who completed the pre/post-questionnaire regarding barriers they experience in the provision of mouth care

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Pre-questionnaire</th>
<th>Post-questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Braddan % (n)</td>
<td>Point Grey % (n)</td>
</tr>
<tr>
<td>Not enough time to do it</td>
<td>44.4 (4)</td>
<td>61.5 (8)</td>
</tr>
<tr>
<td></td>
<td>33.3 (3)</td>
<td>84.6 (11)</td>
</tr>
<tr>
<td>Residents who are uncooperative</td>
<td>88.9 (8)</td>
<td>92.3 (12)</td>
</tr>
<tr>
<td></td>
<td>100.0 (13)</td>
<td></td>
</tr>
<tr>
<td>Don’t know how to do it</td>
<td></td>
<td>7.7 (1)</td>
</tr>
<tr>
<td>Supplies not available</td>
<td>22.2 (2)</td>
<td>69.2 (9)</td>
</tr>
<tr>
<td></td>
<td>11.1 (1)</td>
<td>84.6 (11)</td>
</tr>
<tr>
<td>Residents have bad breath</td>
<td>22.2 (2)</td>
<td>15.4 (2)</td>
</tr>
<tr>
<td>Does not seem to be a priority where I work</td>
<td></td>
<td>7.7 (1)</td>
</tr>
<tr>
<td>Other…. specify</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I experience no barriers</td>
<td>11.1 (1)</td>
<td></td>
</tr>
</tbody>
</table>

The belief statements on the pre-questionnaire at Braddan found that 7 (77.8%) respondents strongly agreed, 1 (11.1%) agreed and 1 (11.1%) strongly disagreed that residents should receive mouth care daily. For the belief that all residents, even those without teeth should have their mouths assessed daily, 4 (44.4%) strongly agreed, 4 (44.4%) agreed and 1 (11.1%) strongly disagreed. For the belief that daily mouth care was an important part of overall care 6 (66.7%) respondents strongly agreed, 2 (22.2%) agreed, and 1 strongly disagreed. For the belief that mouth care should be postponed if residents were uncooperative 2 (22.2%) respondents strongly agreed, 5 (55.6%) agreed, 1 (11.1%) neither agreed or disagreed, and 1 (11/1%) disagreed.
The post-questionnaire at Braddan found that 8 (88.9%) respondents strongly agreed, and 1 (11.1%) agreed that residents should receive mouth care daily. (Table 11) For the belief that all residents, even those without teeth should have their mouths assessed daily, 1 (11.1%) respondents strongly agreed, 5 (55.6%) agreed, and 3 (33.3%) neither agreed nor disagreed. For the belief that daily mouth care was an important part of overall care 4 (44.4%) respondents strongly agreed and 5 (55.6%) agreed. For the belief that mouth care should be postponed if residents are uncooperative, 2 (22.2%) respondents agreed, 5 (55.6%) neither agreed nor disagreed, and 2 (22.2%) disagreed. The beliefs regarding residents receiving mouth care daily and that it is an important part of overall care there was a slight improvement seen. For the beliefs regarding assessing the mouth daily and postponing mouth care for uncooperative residents there was a shift toward the staff being more neutral. Overall once all responses were weighted there was a 9% improvement in attitude of the respondents.

The pre-questionnaire at Point Grey found that 10 (76.9%) respondents strongly agreed and 3 (23.1%) agreed that residents should receive mouth care daily. (Table 12) For the belief that all residents, even those without teeth should have their mouths assessed daily, 3 (23.1%) strongly agreed, 4 (30.8%) agreed, 4 (30.8%) neither agreed nor disagreed, and 2 (15.4%) disagreed. For the belief that daily mouth care was an important part of overall care 11 (84.6%) respondents strongly agreed and 2 (15.4%) agreed. For the belief that mouth care should be postponed if residents were uncooperative 3 (23.1%) respondents strongly agreed, 7 (53.8%) agreed and 3 (23.1%) neither agreed nor disagreed.
The post-questionnaire at Point Grey found that 1 (9.1%) respondents strongly agreed, and 12 (92.3%) agreed that residents should receive mouth care daily. For the belief that all residents, even those without teeth should have their mouths assessed daily, 13 (100%) respondents agreed. For the belief that daily mouth care was an important part of overall care 1 (9.1%) respondents strongly agreed and 12 (92.3%) agreed. For the belief that mouth care should be postponed if residents are uncooperative 13 (100%) respondents agreed. All respondents by the end of the study strongly agreed or agreed with the 4 belief statements.

Table 11: Attitude statement response rates from all caregivers completing the pre/post questionnaire at Braddan

<table>
<thead>
<tr>
<th>Statements</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe residents should receive mouth care daily.</td>
<td>7/8</td>
<td>1/1</td>
<td>1/0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe residents mouths should be assessed daily, even those without teeth.</td>
<td>4/3</td>
<td>0/4</td>
<td>0/4</td>
<td>0/2</td>
<td>1/0</td>
</tr>
<tr>
<td>I believe that daily mouth care is an important part of the residents overall care.</td>
<td>6/4</td>
<td>2/5</td>
<td></td>
<td></td>
<td>1/0</td>
</tr>
<tr>
<td>I believe that mouth care should be postponed if residents are uncooperative.</td>
<td>2/0</td>
<td>5/2</td>
<td>1/5</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>19/15</td>
<td>8/12</td>
<td>1/9</td>
<td>1/4</td>
<td>3/0</td>
</tr>
</tbody>
</table>
Table 12: Attitude statement response rates from all caregivers completing the pre/post questionnaire at Point Grey

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe residents should receive mouth care daily.</td>
<td>10/1</td>
<td>3/12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe residents mouths should be assessed daily, even those without teeth.</td>
<td>3/0</td>
<td>4/13</td>
<td>4/0</td>
<td>2/0</td>
<td></td>
</tr>
<tr>
<td>I believe that daily mouth care is an important part of the residents overall care.</td>
<td>11/1</td>
<td>2/12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that mouth care should be postponed if residents are uncooperative.</td>
<td>3/0</td>
<td>7/13</td>
<td>3/0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>27/2</td>
<td>16/50</td>
<td>7/0</td>
<td>2/0</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 5: Discussion

5.1 Study Population and Facilities

The 2 LTC facilities invited to participate in this study were extended care hospitals. They were chosen because residents of extended care facilities are more dependant on caregivers for their ADL than residents of intermediate facilities (Vigilid 1993). This dependence can place them at greater risk for oral diseases if daily mouth care is not provided (Stockwell 1987). A comprehensive daily mouth care program should have the most impact and improve oral hygiene to a greater extent in extended care due to the large percentage of residents relying on caregivers for the provision of their daily mouth care. Both facilities were owned and managed by one person; therefore a difference in management philosophy should not have influenced the outcome. The facilities had the same number of residents (51) and similar numbers of caregivers (40) so size difference of the facilities did not affect the outcome. One difference between the sites was that at the control facility there was a care aide supervisor who monitored the activities of the care aides throughout the day. At the test facility a nurse was responsible for monitoring daily activities of the care aides. Since the sole responsibility of the care aide supervisor was to monitor care, this may have influenced the outcome due to the increased accountability that she provided.

The residents of both facilities were similar in age with the control site having residents who were slightly younger (5 years on average). At the test site the ratio of women to men was approximately 3:1, whereas at the control site the ratio was almost an
equal 1:1. The ratio of women to men at the test site is comparable to the normal ratio for this population where approximately 75% of those aged 65 and older living in LTC is women (Federal Interagency Forum on Aging-Related Statistics 2000), so the difference most likely did not affect the results. The ratio of residents with teeth or dentures was 13:11 (54% with teeth). Current studies have found that approximately 60% of residents in LTC facilities have teeth (Peltola 2004, Lamster 2004), but this was not the sample that was obtained from the control site in which the ratio was 17:1 or 94% of the residents having teeth. The differences in these variables made it difficult to compare the 2 sites. It would have been advantageous to have the subjects better matched, both within and between the sites in regards to the presence of teeth and/or dentures. Based on discussions with management, better resident participation had been expected, but unfortunately less than 60% of residents at each facility consented to participate and were available for the final analysis.

5.2 Debris on Teeth

The amount of debris on teeth in the test facility was high at the beginning of this study (mean UBC-ODI = 1.90) and did not decrease at either 1 or 4 months after the implementation of the program, but instead increased (mean UBC-ODI = 2.01) a small amount. Ironically the control facility that did not receive the program did show a small decrease in debris on teeth which could be attributed to the Hawthorne effect. The standard deviation of these means was approximately 0.60, which is quite large, but is similar to that of Frenkel et al. (2001) who found their debris on teeth standard deviation to be approximately 0.51. Their study involved 50 dentate subjects and only showed a
small decrease in standard deviation from the findings in this study. A much larger number of subjects would improve on the precision of the debris on teeth measurement.

Other studies that have used debris on teeth to measure change in oral hygiene following an oral health educational intervention have found both similar and contradictory results. Simons et al. (2000) did not find a decrease in debris on teeth or improvement in the oral health of residents following a 90 minute oral health education session, nor did the residents perceive any change in the staff's performance of daily oral hygiene procedures. Provision of a training manual, information leaflets, samples of oral health aides, and a list of places to buy them was also given to the caregivers who attended these sessions. A more recent study by MacEntee (unpublished 2005) also found no statistical difference in the amount of debris on teeth in residents of LTC facilities after oral health education and continued support from a nurse educator at the facilities. Mojon et al (1998) also found no decrease in debris on teeth in 58 residents of a LTC facility 18 months following the implementation of an oral health care program which included an oral hygiene course for caregivers and regular professional care from dental hygienists.

In contrast, Frenkel et al. (2001) found that oral health education was capable of reducing debris on teeth, although they did admit that the average amount of debris on teeth coverage was still over 50%. The reduction in debris was thought to be in part due to the provision of toothbrushes which may have enabled staff and residents to do more tooth brushing. Isaksson et al. (2000) also reported an improvement in oral hygiene
status after a 4 hour oral health education seminar by a dental hygienist for the caregivers of 6 LTC facilities. By the end of their 4 month study 70% residents had good or acceptable oral hygiene as measured by a modified plaque index as opposed to 61% at baseline. This improvement was less than 10%, but considered statistically significant by the investigators. Both of these studies reported a reduction in debris on teeth which was statistically significant, but it is not clear how clinically significant it was. An important note to make though is that Isaksson et al. (2000) did get a positive result in large LTC facilities, which has not been found in other studies that involved larger sites such as this study. It is possible that the longer educational sessions are needed for larger LTC facilities.

Other studies that did not involve traditional educational in-service, but instead focused on the use of different products did find a reduction in debris on teeth. Sumi et al. (2002) used a systematic oral care regimen with 20 dependent elderly adults living at home or in a LTC facility and employed an electric toothbrush, foam swab, tongue brush and Povidone-Iodine solution mouthrinse. The program was performed daily by the caregivers and after 8 weeks plaque was reduced by approximately one third. It would be interesting to see if this could be achieved in a larger LTC facility and how much the program would cost.

It appears from these studies that smaller sized facilities achieve a reduction in debris on teeth following oral health education for the caregivers, while larger facilities seem to remain unchanged irregardless of the intervention. A possible explanation for this is that
in larger facilities employ larger numbers of caregivers and many caregivers are responsible for an individual resident’s care, which can result in less accountability. In smaller facilities or group homes, only a few caregivers would be employed and responsible for a resident’s care. They would be directly accountable for less than satisfactory care. The facilities used in this study were medium sized and possibly too large for the program to show a reduction in debris on teeth.

The length and number of the educational sessions may also be contributing factors to the success of the intervention. The 4 hour sessions provide more time to focus on the relationship between oral health and systemic health. Time is also available to address some of the caregiver’s belief and value system which is necessary if behavioural change is to take place and be maintained (Weeks & Fiske 1994). From a practical standpoint a longer educational session would also provide more time for the caregivers to practice the skills with immediate feedback from a dental professional. Future educational interventions may benefit from longer educational sessions that not only provide knowledge and skill training, but also allow for time to address belief systems of the caregivers which may be a key aspect to changing their attitude toward the provision of daily mouth care.

5.3 Debris on Dentures and Denture Stomatitis

The number of residents entering LTC facilities with some or all of their teeth is increasing, but there are still an estimated 40-50% of residents who are totally edentulous (Miller 1987, Gift 1997, Peltola 2004). Furthermore, some of the residents with teeth
may also have partial dentures. The daily mouth care program tested in this study included the cleaning of dentures so it was important to measure debris on dentures.

Denture hygiene can impact the underlying tissues, and has been found contribute to denture stomatitis and angular cheilitis if *Candida* is present (Budtz-Jorgensen *et al.* 1974, Stenderup 1990). Although, some commercial denture cleansers have a 99% bacterial kill rate (Shay 2000), they haven’t been found to have much of an effect against fungal species such as *Candida* (Gornitsky *et al.* 2002). For this reason the denture storage technique recommended in this program is dry overnight storage, since it has been shown to inhibit growth and reduce colonies of *Candida* on dentures (Stafford 1986, Budtz-Jorgensen *et al.* 2000).

An improvement in denture hygiene was observed at both the test (23%) and control (66%) sites. A decrease in debris on dentures was also found by Budtz-Jorgensen *et al.* (2000) after implementation of an oral health program, while Simons *et al.* (2000) found no difference in debris on dentures after caregivers attended an oral health training course.

The positive results obtained in this study and in that of Budtz-Jorgensen *et al.* (2000) could be attributed in part to the fact that both studies implemented an oral health program not just an educational intervention. On-going dental professional support was an aspect of both programs which may be an effective method of helping staff with denture care. Both studies also used the technique of dry overnight denture storage.
which has been shown to be more effective in reducing colonization by *Candida* (Stafford 1986). By storing dentures dry overnight, it is more likely that the staff brushed or at least rinsed the dentures since they could not rely on a solution to provide any cleansing.

Denture stomatitis was reduced in the maxilla at the test site in this study. Others (Frenkel *et al.* 2001, and Budtz-Jorgensen *et al.* 2000) have also found a decrease in the amount and/or severity of denture stomatitis and angular cheilitis after oral health education. Denture stomatitis is a superficial fungal infection that has the risk of becoming systemic and in the immuno-compromised could prove to be difficult to treat and possibly life-threatening (Stafford 1986). For this reason denture care and storage is very important to the health of residents in LTC facilities since many are immuno-compromised with an increased risk of systemic complications from denture stomatitis.

From the results of this and other studies it appears that denture care is an easier task than tooth brushing for caregivers to perform. Denture care is performed outside of the mouth, can be visualized and is not affected by uncooperative resident behaviour. Tooth brushing may require more practice from caregivers and an improvement in clinical outcomes such as debris on teeth and gingivitis may not be achievable immediately following education and training. As caregivers become better and more comfortable with tooth brushing a reduction in debris on teeth and gingivitis should be seen, but may take more time. Caregivers have been cleaning dentures for years, but just recently has there been a shift in the type of mouth care they are required to perform. As more
residents with teeth enter LTC facilities, the amount of tooth brushing will need to increase. It will be interesting to see if with continued support and education if it is possible to decrease debris on teeth and gingivitis to that of debris on dentures and stomatitis.

It may be possible that the provision of daily mouth care by caregivers will not improve and that educational efforts should be focused elsewhere. Training one individual to be responsible for daily mouth care of the residents, similar to that of the “oral care link nurse” may be what is needed. The cost incurred by a facility employing such an individual has been estimated to be less than the cost of treating systemic illness related to oral bacteria such as aspiration pneumonia (Kubilius et al 2004). Future study in this area is needed to assess the feasibility of such a model.

5.4 Gingivitis

The amount of gingivitis measured in this study was very low. Although bleeding on probing has been reported to be a good indicator of gingival inflammation, it has also been shown that inflamed gingival tissues don’t always bleed (Greenstein 1984). The gingival tissues in Figure 5 appear to be inflamed, but when a manual periodontal probe was inserted 2mm sub-gingival at a 60 degree angle to the tooth and swept along the sulcus lining no bleeding occurred. When measured with a visual gingivitis index (Lobene et al. 1986) this tissue was classified as moderately to severely inflamed.
Figure 5: Gingival Tissues of Resident Participants

Periodontal probing is technique sensitive and could have contributed to the minimal bleeding found in this study. It is known that pressure, angle and depth of insertion of the periodontal probe into the gingival sulcus can vary within and between operators (Ainamo & Bay 1975, Barnett et al. 1980, Saxer et al. 1977, Nowicki et al. 1981). This study was interested in gingivitis, therefore probing of the marginal gingiva (1-2mm sub-gingival) was utilized since it has been proposed as a more accurate measure of gingivitis, while probing to the base of the pocket has been suggested as a better measure of periodontitis (Spolsky 1996). Periodontal probing of the marginal gingiva does not require vertical pressure to reach the base of the pocket which may improve on the accuracy of the results since pressure is not a factor. Probing pressure can vary and different forces have been tested (Lang et al 1991). Pressure of more than 0.25N from a manual or force controlled probe has been suggested as too great since it may puncture the junctional epithelium with the resultant bleeding due to trauma not inflammation (Lang et al 1991). Angle of the periodontal probe has also been suggested as an important variable in eliciting bleeding. Van der Weijden (1994) found that insertion of
the periodontal probe into the sulcus at 60 degrees to the tooth as opposed to parallel was a more accurate technique to identify healthy gingival tissues.

Although the gingivitis measurement technique used in this study was found by Van der Weijden (1994) as appropriate in the measurement of gingivitis, the presence disease may have been grossly underestimated. The use of a non-invasive measure that uses only a visual assessment may be a better choice for examiners who are reluctant to probe sensitive gingival tissues in elderly, medically compromised subjects.

5.5 Caregivers Attitudes and Beliefs

Qualitative methods of investigation such as questionnaires and interviews are able to uncover a subject’s values and beliefs (Blinkhorn et al 1989). This information combined with quantitative data may better explain an area of investigation. In oral health education of caregivers it has been shown that a caregiver’s attitude and knowledge level regarding daily mouth care can have an effect on its provision (Frenkel 1999). To avoid relying solely on a measurable clinical outcome such as debris and gingivitis, a questionnaire was also included in this study to measure any change in knowledge, attitude and behaviour of the caregivers in the provision of daily mouth care. A four month study may not be long enough to show a measurable change in clinical outcomes since it can take some time for a new behaviour to become adopted.

A decrease in knowledge as measured by true/false questions at the test and control sites was a surprising result, since other investigators have found that knowledge
increased after an educational session (Frenkel et al. 2002, Simons et al. 2000, Paulsson et al. 2001) and that knowledge can be sustained for up to 3 years (Paulsson et al. 2001). This lack of increase in knowledge could be attributable to strongly held beliefs that could not be changed with the educational program as it is now. It may also be possible that the questions were not well designed and created confusion.

The most common barriers reported by caregivers at the test site both before and after implementation of the program were not enough time to perform mouth care and residents not cooperating with the care. These barriers and lack of provision of mouth care supplies by facilities have been found to be prominent in other studies (Weeks & Fiske 1994, Frenkel 1999, Chung 2000, Frenkel et al. 2002, MacEntee unpublished 2005). In order for lack of mouth care supplies not to be a barrier to providing care, tooth brushes, denture brushes, toothpaste, mouth rinse, floss, proxabrushes, oral lubricants and mouth props were provided to the test site. Lack of mouth care supplies was not a perceived barrier at the test site, but was at the control site by the end of the study. In contrast to other studies that have reported that mouth care was not a priority, it was not indicated as a barrier in this study. Even though it was thought of as a priority, the oral hygiene did not improve.

The amount of time that caregivers provided mouth care did not change significantly during the study indicating that either the provision of mouth care did not increase or that staff became more proficient at the care. Time did not prove to be a good indicator of a change in behaviour, since time doesn’t equal quality in all situations.
There was a slight decrease in attitude towards providing daily mouth care at Braddan since more responses from the “agree/strongly agree” shifted to “neither agree nor disagree”. At Point Grey all responses were “agree/strongly agree” at the end of the study with 9 responses shifting from “disagree” and “neither agree or disagree”. These findings are in contrast to that of Frenkel et al. 2002 who found an improvement in caregiver’s attitude toward the provision of daily mouth care following education, and no change in attitude in sites that did not receive education.

Observations and informal discussions with nurses and care aides revealed that although no measurable improvements were found with debris on teeth and gingivitis, the program was well accepted and thought of as important. The nurses indicated that the new nursing oral assessment form was much more comprehensive than what they were previously using and that it better enabled them to design an individualized oral care plan for the residents. They also stated that they were completing them, which was not the case before implementation of the program. They also felt that the standardized mouth care cards which they could individualize saved time and effort in the development of the care plans. The head nurse thought that the program increased the awareness of oral health and that it was no longer seen as ‘just the dentist’s job’ to assess the mouth. She also indicated that the facility seemed to be more interested in prevention of oral problems.
The care aides indicated that they learned a lot from the educational sessions and that it was information that they could also use in their own lives. They indicated that the resident’s breath was better and that they were noticing less bleeding of the gums during tooth brushing. It was encouraging to me that they were noticing less bleeding and that they were aware it was a possible improvement in that resident’s oral hygiene. They also liked the fact that the products and dentures were now labelled making it easier for them to identify who they belonged to.

Both the nurses and care aides appreciated the new Daily Mouth Care manual and felt that it provided them with support both from an educational and procedural standpoint. It was efficient to have supply lists, inventory sheets, oral assessment forms and mouth care cards in the same place. The aspect of the program that they liked the most was the provision of mouth care supplies. They no longer needed to wait for the facility or family members to purchase needed supplies. They felt this improved the consistency and continuity of the mouth care, since it was never disrupted due to lack of supplies. They appreciated the ability to purchase them from supply houses instead of local pharmacies which greatly reduced their cost. This they hoped would be an incentive for management to continue on with the regular stocking of these products. The provision of all necessary products for the 51 residents cost approximately $350.00 which would amount to about $7.00/year per resident. (Appendix 5)

When questioned about aspects of the program that they didn’t enjoy, neither the nurses or care aides could think of anything, but did have some suggestions for
improvement. They found that the mouth rinse was too strong for some of the residents and wanted to know if there was another that they could purchase. They also thought that an annual follow-up and update of the products and educational material would be important to keep the program current. They also indicated that it would be beneficial to have the dental hygienist do 3 month visits to the facility for approximately 1 hour to help in the maintenance of the program by providing on-going support. Overall they were very positive towards the daily mouth care program and did not feel that it added any burden to their workload. They indicated they would continue on with the oral assessments, use of the mouth care cards, and labelling of products and dentures, and hoped that the products would continue to be supplied by management.

Beliefs and attitudes of caregivers appear to play a role in the provision of mouth care and future programs will need to better address this aspect. Longer and more frequent educational sessions may be one way of being able to spend the time needed to address belief systems and to work through them with caregivers. Caregivers may also benefit from continual support from a dental professional in their efforts to provide mouth care to the residents. A dental hygienist whose expertise is in oral hygiene techniques and products may be a beneficial addition to health care teams within LTC facilities and could provide on-going maintenance to mouth care programs as well as supervision to a specially trained oral care nurse.
5.6 Recommendations:

1. To test for an improvement in oral hygiene (debris, gingivitis, stomatitis) a larger sample size may be needed.

2. A sample based on multiple LTC facilities may be more representative of the population.

3. A less intrusive gingivitis index may improve the examiner's ability to detect inflammation.

4. In-service sessions that are longer than 1 hour and more frequent.

5. Educational material that focuses on motivating the care aides with more emphasis on the oral health and its affects on overall health.

6. Change in educational approach.

7. Shorten and simplify the written support material.

8. Have an invigilator present during the completion of the questionnaires to ensure that participants are not sharing answers.

10. Consider the education of a specially trained oral care aid who solely provides daily mouth care.
Chapter 6: Conclusion

The oral hygiene of residents in LTC facilities continues to need improvement. Poor oral hygiene places this population at increased risk of oral and systemic diseases. Since many of the residents who reside in LTC facilities rely on caregivers to perform their daily mouth care, educational efforts have been focused towards them. This study provided caregivers with a comprehensive daily mouth care program that included education on the importance and techniques of mouth care as well as the provision of products, written reference material, and on-going professional support. Although the care aides and nurses appreciated the program and felt that it had a positive impact on their ability to provide daily mouth care, this intervention did not improve the oral hygiene of the residents as measured by debris on teeth and gingivitis, but did show an improvement in debris on dentures and stomatitis.
CHAPTER 7: REFERENCES

Adams R. *Qualified nurses lack adequate knowledge related to oral health resulting in inadequate oral care of patients on medical wards.* J Adv Nurs 1996;24:552-60.


Newton AV. *Denture sore mouth.* Br Dent J 1962;112:357-60.


Rak OS and Warren K. *An assessment of the level of dental and mouthcare knowledge amongst nurses working with elderly patients.* Community Dent Health 1990 sep;7(3):295-301.


Appendix 1

Mouth Care Practice Guidelines
Bradden Private Hospital

EXPECTED OUTCOME
The residents will exhibit a clean, moist, intact mouth, free from oral disease.

BACKGROUND INFORMATION
Residents may be at risk for inadequate oral hygiene with the potential for alterations in the mouth leading to impaired nutrition, pain, oral infection, speech difficulties, and/or reduced self-esteem. A healthy mouth helps to maintain general health. Mouth care is an integral part of nursing care and focuses on successful prevention of alterations in the mouth through assessment, implementation of an appropriate mouth care regimen and resident education.

INDICATIONS
To be implemented for all residents of the facility and individualized to the resident’s needs.

DEFINITIONS

Dental Health Care Professional (DHCP): (as per the BC reg 329/97 section 9.2)
A person who is a member of
(a) The College of Dental Surgeons of British Columbia
(b) The College of Dental Hygienists of British Columbia or
(c) The College of Denturists of British Columbia

Oral Assessment: Performed by an RN, MD or DHCP on admission, annually, and as needed. Assessment data to include:
(a) Presence/absence of natural teeth
(b) Presence and condition of dentures and the underlying tissues
(c) Condition of lips
(d) Condition of cheeks and inner surfaces of the lips
(e) Condition of gums
(f) Condition of the tongue and floor of the mouth
(g) Condition of the palate and pharynx

Oral Examination: Performed by a DHCP ideally on a yearly basis to include a full examination of the hard and soft structures of the oral cavity.

Screening: Done by a RN, LPN or RCA on a daily basis prior to mouthcare as outlined in “Mouth Care for Persons in Residential Care” in-service manual. Screening involves checking teeth, gums, tongue, cheeks, palate and lips for:
- Sores, abnormal coloration, dryness, swelling, plaque and bleeding
STANDARDS

- On admission, annually and as needed the resident will receive an oral assessment by a Registered Nurse (RN), Medical Doctor (MD) or a Dental Health Care Professional (DHCP).

- On admission, the designated person will ensure that the resident's dentures are labeled and if not, this will be done as soon as possible. (Appendix 1)

- On admission, the resident will be given the appropriate mouth-care supplies depending on the presence of teeth and/or dentures. All mouthcare supplies will be labeled with the resident's name.

- Oral examinations by a DHCP will be encouraged at least once per year.

- Every resident staying at the facility for more than 2 weeks will have an individualized mouth care plan developed and implemented.

- The resident's mouth will be screened on a daily basis by the RCA.

- Each resident will receive mouth care twice daily, in the morning and at bedtime, or more often as needed.

- The resident and/or support person will be encouraged to perform/assist with the resident's mouth care.

- Disposable, single use vinyl gloves will be worn when performing mouth care.

- Toothbrushes will be changed every 4 months and after an upper respiratory infection, or as required.

- Denture brushes will be changed yearly and as required.

- Denture cups will be changed as required.

RESIDENT/FAMILY EDUCATION

- Provide pamphlet about mouth care entitled “Mouth Care for Persons in Residential Care
- Discuss how they can participate/assist in the individualized mouth care plan.
ROLES OF THE TEAM MEMBERS

Dentist
- Will be responsible for the examination, diagnoses and treatment of oral disease and conditions.

Physician
- Assess the oral cavity as required.
- Liaise with the Dentist as required.
- Provide medical history for surgical intervention as required.

Registered Nurse
- Complete and document initial, annual and PRN assessment of the mouth.
- Collaborate with resident, family and other team members to develop an initial individualized mouth care plan and update as required.
- Liaise with the Dentist, and Physician regarding oral care concerns.
- Educate residents, family and staff regarding individualized mouth care plan.
- Ensure resident has necessary supplies at the bedside to complete individualized mouth care plan.
- Complete mouth care as required.
- Refer residents with mouth care problems to the Dentist.

Residential Care Attendant
- Screen mouth daily.
- Complete mouth care 2x daily (AM & PM) and PRN.
- Report any change in mouth to the RN.
- Ensure resident has necessary supplies at the bedside to complete individualized mouth care plan.

Receptionist
- Ensure dental documents are in the chart.
- Liaise with the resident/families and dental services regarding appointments.
- Arrange transportation.

Occupational Therapist
- Liaise with nursing staff regarding special positioning techniques for completion of dental care.
- Provide specialized positioning supplies.
- Consult on mouth care procedure for people who have swallowing difficulties.
- Recommend and/or provide adaptive tools for resident to maintain independence with mouth care.
Dietitian

- Liaise with nursing staff regarding specific dietary needs.

SUPPLIES/MATERIALS

* Upon admission each resident will receive the appropriate mouth care supplies.

* Supplies will be replaced as required from ward stock, which will be funded through a pre-approved annual charge to the resident.

Resident with teeth:
1. Fluoride toothpaste
2. Toothbrush
3. Antibacterial Fluoride mouthrinse (to be added only if there is an increased caries risk)

Resident with dentures:
1. Denture cup
2. Denture brush
3. Toothbrush
4. Antibacterial Fluoride mouthrinse

Resident with teeth and dentures:
1. Denture cup
2. Denture brush
3. Fluoride toothpaste
4. Toothbrush

Resident without teeth and dentures, and those who are unconscious or who cannot swallow:
1. Toothbrush
2. Antibacterial Fluoride mouthrinse
Individualized care plans may include the following special products:

1. Mouth props for residents who can't keep their mouth open
2. Water-soluble lubricant
3. Lozenges to stimulate natural saliva before meals
4. Antibacterial Fluoride mouthrinse
5. Dental floss
6. Proxabrushes
7. Chlorhexidine (by prescription)
8. Nystatin (by prescription)

PROTOCOL/PROCEDURE:

Assessment of Mouth (Appendix 2)
- Lips: moist, dry, cracked
- Inner Cheeks and Lips: moist, dry, pink, white, red, painful
- Tongue: moist, dry, pink, white, red, painful
- Under Tongue: moist, dry, pink, white, red, painful
- Gums: pink, white, red, bleeding, painful
- Teeth: clean, coated, intact, fractured, implants, painful
- Palate and Edentulous Ridges: pink, white, red, lumps
- Dentures: upper, lower, full, partial, labeled, cracked/broken

Routine Mouth Care
Care plans will be individualized based on the resident’s cognitive and functional ability following the guidelines below.

Routine Mouth Care – Conscious Resident (Appendix 3)
With teeth:
- Screen mouth daily.
- Brush teeth and tongue with a pea-size amount of fluoride toothpaste 2x daily (AM & PM).
- Hold toothbrush at a 45 degree angle when brushing teeth to gently massage gum line.
- Brush tongue from back to front to avoid gagging.
- If possible, floss teeth or use a proxabrush daily.
- Rinse and dry off toothbrush with a paper towel and store
With dentures
- Screen mouth daily.
- Remove dentures at night.
- Brush dentures with a denture brush and liquid soap over a water filled sink.
- Rinse well with warm water.
- Store dentures dry in a labeled denture cup.
- Brush gums, tongue, roof of mouth and cheeks with a toothbrush dipped in mouthrinse.
- Rinse and dry off denture and toothbrush with a paper towel and store.
- Rinse dentures with water to moisten before reinserting into mouth.

With teeth and dentures
- Screen mouth daily.
- Remove dentures at night.
- Brush dentures and clasps on partial dentures with liquid soap and water.
- Rinse well with warm water.
- Store dentures dry in a labeled denture cup.
- Brush gums, tongue, roof of mouth and cheeks with a toothbrush dipped in mouthrinse.
- Brush any teeth in the mouth with fluoride toothpaste.
- Rinse and dry off denture and toothbrush with a paper towel and store.
- Rinse dentures with water to moisten before reinserting into mouth.

Routine Mouth Care - Unconscious Resident and Resident Unable to Swallow (Appendix 4)
DO NOT USE TOOTHPASTE

With Teeth:
- Screen mouth daily.
- Lubricate lips with water-soluble lubricant
- If conscious and unable to swallow position resident sitting straight up or lying to one side to aid in drainage.
- If Unconscious turn residents to one side to aid in drainage and place mouth prop between teeth on side turned down.
- Place towel and/or K-basin at side of the mouth to catch drainage.
- Dip toothbrush in mouthrinse to moisten. Shake off excess moisture.
- Brush teeth, gums, tongue, roof of mouth and cheek on side of mouth turned down.
- Remove excess moisture with a gauze/washcloth.
- Turn resident to the other side and repeat.
- Rinse and dry off toothbrush with a paper towel and store.
- Lubricate lips and mouth with water-soluble lubricant.
Without Teeth:
- Screen mouth daily.
- Lubricate lips with water-soluble lubricant
- If conscious and unable to swallow position resident sitting straight up or lying to one side to aid in drainage
- If unconscious turn residents to one side to aid in drainage
- Place towel and/or K-basin at side of the mouth to catch drainage.
- Dip toothbrush in mouthrinse to moisten. Shake off excess moisture.
- Brush gums, tongue, roof of mouth and cheek with a toothbrush dipped in mouthrinse.
- Remove excess moisture with a gauze/washcloth.
- Turn resident to the other side and repeat.
- Rinse and dry off toothbrush with a paper towel and store
- Lubricate lips and tissues with water-soluble lubricant.

Specialized Mouth Care Protocol (Appendix 5)

Mouth Sores
- Leave dentures out as much as possible
- Saline mouthrinse held in mouth or rinsed 4 X daily depending on residents ability. (Note: to make saline rinse place 1 teaspoon of salt in 8 ounces of warm water. Stir until dissolved)
- Avoid acidic juice or food.
- Monitor and if not improving after 1 week contact MD.

Dry Mouth
- Lubricate lips and mouth with water-soluble lubricant before mouth care, meals and at bed-time.
- Increase daily fluids/ice chips or thickened fluid intake.
- Avoid acidic juice/foods
- If available, give resident saliva stimulating lozenge before meals.
- If the resident is able to rinse and has teeth, add antibacterial fluoride mouthrinse to routine mouth care.

Bleeding Gums
- Brush teeth and gums with a soft toothbrush and fluoride toothpaste 2 X daily (AM & PM). Increase if possible.
- Bleeding should be reduced within 1 week, if not contact MD for assessment
- Residents receiving chemotherapy or blood thinners will have a higher incidence of bleeding. Consult MD or DHCP for these residents before mouth care regimen is started
Inflammation
- Use new toothbrush.
- Brush with fluoride toothpaste 2 X daily (AM & PM). Increase if possible.
- If inflammation does not improve in 1-week consult MD - Chlorhexidine may be indicated.
- If inflammation under a denture:
  1. Check fit, clean denture and denture cup, etc.
  2. Consult MD for possible fungal infection and need for Nystatin and/or Chlorhexidine.

DOCUMENTATION
The following documentation tools support the mouth care guidelines:
1. Nursing Assessment: Oral Condition
2. Mouth Care Protocol Algorithms
3. Mouth Care Protocol Cards

Moving In
Nursing
- The RN will complete the Nursing Assessment: Oral Condition form within 7 days of a resident moving into the facility.
- Based on the assessment information, the appropriate mouth care protocol will be identified in the care plan and corresponding colour coded protocol card will be posted next to the ADL chart.
- If a resident requires specialized mouth care the RN will post the “Specialized Mouth Care Protocol” algorithm beside the ADL chart with the appropriate section(s) highlighted in yellow.
- Chart relevant mouth care focus in the progress notes.

On-going
- All members of the health care team will chart relevant assessments, and treatments in the “Interdisciplinary Progress Notes”.
- RN will complete “Nursing Oral Assessment” prior to annual care conference.
- RCA will indicate on the “Daily Flow Sheet” that mouth care has been completed.
REFERENCES:


Zimmer S. Caries preventive effects of fluoride products when used in conjunction with fluoride dentifrice. *Caries Res* 35 (suppl 1): 18-21, 2001
DEVELOPED BY:

Leeann Donnelly RDH, BDSc, MSc (cand) UBC Faculty of Dentistry.

Adapted from Providence Health Care: Daily Mouthcare Practice Guidelines and Protocols. (January 2003)
Appendix 1

DENTURE LABELING

STANDARD:

- All residents will have upper and/or lower dentures labeled with their first initial and last name upon admission.
- All residents will have any newly made upper and/or lower dentures labeled.
- All existing dentures will be labeled.
- Dentures should be checked routinely to assure labeling is still visible.

RATIONALE:

Labeling dentures is an effective way to prevent loss or mix-up of dentures. It is inexpensive when compared to the cost of replacing dentures.

DENTURE LABELING PROCEDURE:

Supplies:
- dry abrasive pads, or fine grit sandpaper, approximately 1x1cm
- mechanical pencil
- clear acrylic resin
- alcohol swabs
- cotton swabs
- vinyl gloves

Procedure:

- Explain the procedure to the resident.
- Wash hands and put on gloves.
- Ask the resident to remove their denture(s) or assist removal of denture(s).
- Clean the denture(s) thoroughly with the resident’s denture brush and liquid hand soap.
- Rinse the denture(s) thoroughly.
- Dry the denture(s).
- Abrade a small area (15x5mm) of the denture(s) using the abrasive pad. Both the upper and lower dentures should be abraded at the back of the denture on the smooth cheek side.
- Discard abrasive pad.
- Using an alcohol swab, clean the newly abraded area. This removes acrylic dust and prevents contamination of the acrylic resin.
- Discard alcohol swab.
- Write the resident’s first initial and last name on the abraded area using the mechanical pencil. (ie. M. Jones).
• Using a cotton swab, paint one thin coat of the acrylic resin over the abraded area.
• Discard cotton swab.
• Close the bottle of acrylic resin immediately.*
• Let the acrylic resin on the denture(s) dry for one minute and do not blow on it to speed drying.
• Using a new cotton swab, paint a second coat of the acrylic resin over the first coat.
• Discard cotton swab.
• Close the bottle of acrylic resin immediately.
• Let the second coat of acrylic resin dry completely (approximately 15 minutes)*.
• Rinse the denture(s) thoroughly with water.
• Return the denture(s) to the resident.

*Notes:
If dentures are to be labeled outside of the resident’s room, make sure to place them in a bag labeled with resident’s name to ensure they are returned to their owner.

It is important to maintain sterile conditions during the denture labeling procedure.

Acrylic nail polish is a flammable solvent. Avoid breathing the vapors and avoid eye contact. Keep away from heat and flame.

A burning sensation may occur if the dentures are returned to the mouth too soon. Allow the full 15 minutes for the acrylic to dry and rinse well before placing the dentures in the mouth.
Appendix 2

ROUTINE MOUTH CARE PROTOCOL: CONSCIOUS RESIDENT

ASSESSMENT

Problem Identified

No Problem Identified?

Initiate Specialized Oral Hygiene Protocol(s)

INITIATE ONE OR MORE OF THE FOLLOWING PROTOCOLS

Residents with Dentures:
- Screen mouth daily.
- Remove dentures at night.
- Brush dentures with liquid soap and water.
- Rinse well with warm water.
- Brush gums, tongue, roof of mouth and cheeks with a toothbrush dipped in mouthrinse.
- Store dentures dry in a labeled denture cup.
- Rinse dentures with warm water to moisten before reinserting in mouth.

Residents With Teeth:
- Screen mouth daily.
- 2x daily brush teeth and tongue with a pea-size amount of fluoride toothpaste.
- Gently massage gumline with toothbrush, hold at a 45 degree angle, when brushing teeth.
- Brush tongue from back to front to avoid gagging.
- If possible, floss teeth or use a proxabrush daily.
- Rinse and dry off toothbrush with a paper towel and store dry in K-Basin.
- Brush any teeth in the mouth with fluoride toothpaste.
- Store dentures dry in a labeled denture cup.
- Rinse dentures with warm water to moisten before reinserting in mouth.

Residents With Teeth and Dentures:
- Screen mouth daily.
- Remove dentures at night.
- Brush dentures and clasps on partial dentures with liquid soap and water.
- Rinse well with warm water.
- Brush gums, tongue, roof of mouth and cheeks with a toothbrush dipped in mouthrinse.
- Brush any teeth in the mouth with fluoride toothpaste.
- Store dentures dry in a labeled denture cup.
- Rinse dentures with warm water to moisten before reinserting in mouth.

Add protocol to Care Plan.
Set next evaluation date: PRN every 12 months

Maintained

Not Maintained

Continue protocol(s)
Set 12 month evaluation date

Adapted from the VGH-UBC Nursing Practice Council: Geriatrics & Family Practice Oct. 1997 Holy Family Hospital, Mouth Care Guideline, Jan 1998
Appendix 3

ROUTINE MOUTH CARE PROTOCOL - UNCONSCIOUS RESIDENT AND RESIDENT UNABLE TO SWALLOW

ASSESSMENT

No Problem Identified

Problem Identified

Initiate Specialized Oral Hygiene Protocol(s)

INITIATE ONE OR MORE OF THE FOLLOWING PROTOCOLS

Residents With Teeth:
DO NOT USE TOOTHPASTE

- Screen mouth daily.
- Lubricate lips with water-soluble lubricant
- If conscious and unable to swallow position resident sitting straight up or lying to one side to aid in drainage.
- If unconscious turn residents to one side to aid in drainage and place mouth prop between teeth on side turned down.
- Place towel and/or K-basin at side of mouth to catch drainage.
- Dip toothbrush in mouthrinse to moisten. Shake off excess moisture.
- Brush teeth, gums, tongue, roof of mouth & cheek on side of mouth turned down.
- Remove excess moisture with a gauze/washcloth.
- Turn resident to the other side and repeat.
- Lubricate lips and mouth with water-soluble lubricant.

Residents Without Teeth:
DO NOT USE TOOTHPASTE

- Screen mouth daily.
- Lubricate lips with water-soluble lubricant.
- If conscious and unable to swallow position resident sitting straight up or lying to one side to aid in drainage.
- If unconscious turn resident to one side to aid in drainage.
- Place towel and/or K-basin at side of mouth to catch drainage.
- Dip toothbrush in mouthrinse to moisten. Shake off excess moisture.
- Brush gums, tongue, roof of mouth & cheek on side of mouth turned down.
- Remove excess moisture with gauze/washcloth.
- Turn resident to the other side and repeat.
- Lubricate lips and mouth and water-soluble lubricant.

Not Maintained

Add protocol to Care Plan.
Set next evaluation date: PRN every 12 months

Maintained

Continue protocol(s)
Set 12 month evaluation date

Adapted from the VGH-UBC Nursing Practice Council:
Geriatrics & Family Practice Oct '97
Holy Family Hospital, Mouth Care Guideline, Jan. '98
Appendix 4

SPECIALIZED MOUTH CARE PROTOCOL

Assessment

No Problem
Identified. Initiate Routine Protocol(s)

If Any Problem(s)
Discuss With MD And Refer To Dentist

Initiate Routine Oral Hygiene And One Or More Specialized Protocol(s)

Mouth Sores:
- Leave dentures out as much as possible
- Saline mouthrinse held in mouth or rinsed 4 x daily depending on resident's ability.
  (Note: to make saline rinse place 1 teaspoon of salt in 8 ounces of warm water. Stir until dissolved.)
- Avoid acidic juice or food.
- Monitor and if not improving after 1 week contact Dental Health Care Professional (DHCP).

Dry Mouth:
- Lubricate lips and mouth with water-soluble lubricant before mouth care, meals, & at bedtime (AM & PM)
- Increase daily fluids/ice chips or jelled fluid intake.
- Avoid acidic juice or foods.
- If available, give resident saliva stimulating lozenge before meals.
- If resident is able to rinse, add antibacterial fluoride mouthrinse to daily mouth care.

Bleeding Gums:
- Brush teeth and gums with a soft toothbrush and fluoride toothpaste 2 x daily (AM & PM).
- Bleeding should be reduced within 1 week, if not contact DHCP for assessment.
- Residents receiving chemotherapy or blood thinners will have a higher incidence of bleeding.
  *Consult RN/MD/DHCP for these residents before mouth care regimen is started.

Inflammation:
- Use new toothbrush.
- Brush with fluoride toothpaste 2 x daily (AM & PM).
- If inflammation does not improve in 1-week consult dentist - Chlorhexidine may be indicated.
- If inflammation under a denture: check fit, clean denture cup etc.
- Consult physician or dentist for possible fungal infection and need for Nystatin and/or Chlorhexidine.

Discontinue specialized & initiate routine protocol(s)

Improved

Add protocol to care plan. Reassess daily and PRN

Not Improved

Adapted from the VGH-UBC Nursing Practice Council: Geriatrics & Family Practice Oct. 1997 Holy Family Hospital, Mouth Care Guideline, Jan 1998
## PRODUCTS LIST AND PRICES

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>COST OF EACH UNIT</th>
<th># OF RESIDENTS</th>
<th>UNITS PER YEAR PER RESIDENT</th>
<th>YEARLY TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral-B 750ml Anti-bacterial Mouthrinse no alcohol</td>
<td>$2.37</td>
<td>51</td>
<td>1</td>
<td>$120.87</td>
</tr>
<tr>
<td>Butler Gum #409C1 Toothbrush</td>
<td>$0.31</td>
<td>51</td>
<td>3</td>
<td>$47.43</td>
</tr>
<tr>
<td>Crest 20ml Regular Toothpaste</td>
<td>$0.29</td>
<td>30</td>
<td>3</td>
<td>$26.10</td>
</tr>
<tr>
<td>Denture Brush</td>
<td>$0.56</td>
<td>30</td>
<td>1</td>
<td>$16.80</td>
</tr>
<tr>
<td>Denture Cup</td>
<td>$0.16</td>
<td>30</td>
<td>1</td>
<td>$4.80</td>
</tr>
<tr>
<td>Butler 12yd Floss</td>
<td>$0.26</td>
<td>*1 box (72)</td>
<td></td>
<td>$18.50</td>
</tr>
<tr>
<td>Butler Gum Proxabrush Handle</td>
<td>$0.37</td>
<td>*2 boxes (24)</td>
<td></td>
<td>$8.90</td>
</tr>
<tr>
<td>Butler Gum Proxabrush Refills</td>
<td>$0.14</td>
<td>*1 box (100)</td>
<td></td>
<td>$14.00</td>
</tr>
<tr>
<td>Open Wide Mouthprop</td>
<td>$1.34</td>
<td>*1 pkg (50)</td>
<td></td>
<td>$67.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$324.44</strong></td>
</tr>
</tbody>
</table>
## Appendix 6
### NURSING ASSESSMENT: ORAL CONDITION

**INSTRUCTIONS:**
Please check (X) all boxes that apply and/or describe the condition. Complete care planning at the end of the form. Refer conditions that appear abnormal.

<table>
<thead>
<tr>
<th>ASSESSMENT</th>
<th>APPEARANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITION OF TEETH</td>
<td>![NORMAL] □ Clean □ Intact □ Implants present ![ABNORMAL] □ Coated □ Decayed □ Fractured □ Painful</td>
</tr>
<tr>
<td>CONDITION OF DENTURES</td>
<td>![NORMAL] □ Uppers Full □ Partial □ Labeled □ Y □ N ![ABNORMAL] □ Lower Full □ Partial □ Labeled □ Y □ N □ Clean □ Cracked/broken □ Painful</td>
</tr>
<tr>
<td>SWALLOWING DIFFICULTY</td>
<td>![NORMAL] □ Yes □ No ![ABNORMAL] □ Yes □ No</td>
</tr>
</tbody>
</table>
MARK ANY AFFECTED ORAL AREAS

CARE PLANNING

1. Describe current oral hygiene routine _______________________________________

2. Assessed for routine mouth care □ Y □ N (if yes, specify) _______________________

3. Assessed for specialized mouth care □ Y □ N (if yes, specify) ____________________

4. Conclusions/Recommendations ________________________________________________

For all conditions that appear abnormal, refer for assessment by a dental professional

5. Referral to dental professional: □ Y □ N Name: ________________________________

Date: ________________________________

NAME/TITLE: ________________________________

SIGNATURE: ________________________________ DATE ________________________________
Appendix 7

Teeth

Name: ________________________________

Supplies: toothbrush, toothpaste

1. Brush teeth 2x daily (am&pm) with a pea-sized amount of fluoride toothpaste
2. Clean tongue, gums and lining of mouth with rinsed toothbrush

Special Instructions: __________________________________________________________


Dentures

Name: ________________________________

Supplies: toothbrush, denture brush, denture cup, mouthrinse

1. Brush dentures 2x daily (am&pm) with denture brush and liquid hand soap
2. Clean tongue, gums and lining of mouth with toothbrush dipped in mouthrinse
3. Store dentures overnight in dry denture cup; moisten before re-inserting

Special Instructions: __________________________________________________________


Teeth  

Name: 

Supplies: toothbrush, toothpaste, denture brush, denture cup

1. Brush teeth 2x daily (am & pm) with a pea-sized amount of fluoride toothpaste
2. Clean tongue, gums and lining of mouth with rinsed toothbrush
3. Brush dentures 2x daily (am & pm) with denture brush and liquid hand soap
4. Store dentures overnight in a dry denture cup; moisten before re-inserting

Special Instructions: ______________________________________________________________________
_____________________________________________________________________________________

Dentures
Unable to Swallow

No Toothpaste

Name: ____________________________

Supplies: toothbrush, mouthrinse **DO NOT USE TOOTHPASTE**

1. Turn resident to one side. If **conscious**, resident may also sit straight up.
2. Place mouth prop between teeth on side turned down.
3. Brush teeth 2x daily (am&pm) with **mouthrinse**.
4. Brush tongue, gums and lining of mouth with **mouth rinse**.

Special Instructions: ____________________________________________

_________________________________________

Unable to Swallow

No Toothpaste

Name: ____________________________

Supplies: toothbrush, mouthrinse **DO NOT USE TOOTHPASTE**

1. Turn resident to one side. If **conscious**, resident may also sit straight up.
2. Place mouth prop between teeth on side turned down.
3. Brush teeth 2x daily (am&pm) with **mouthrinse**.
4. Brush tongue, gums and lining of mouth with **mouth rinse**.

Special Instructions: ____________________________________________

_________________________________________
Appendix 9

**FACILITY ASSESSMENT**

**FACILITY:** Braddan Private Hospital

**ADMINISTRATOR:** Maureen McIntosh

**CLINICAL NURSE EDUCATOR:** None

**NURSES:** 5

**CARE AIDES:** 35

**NUMBER OR RESIDENTS:** 51

**INDIVIDUALIZED ORAL HEALTH CARE PLANS:** Care plans are kept in an ADL chart at the nursing station. There is no formal section for oral care, it is documented under special needs. Inspection of the ADL's showed that 7 residents had an oral care plan documented. Alice Wedge had a bedside oral care plan taped to her lamp. It was supplied by her private dental hygienist – Linda Martens.

**PAST ORAL HEALTH CARE EDUCATION:** The most recent oral health care education was provided by the Vancouver Health Board approximately 2 years ago. The education was provided by a dental hygienist and covered the basics of daily mouth care. Approximately 5-6 years ago a dental hygienist provided clinical services to the facility. She also gave 1 in-service presentation on daily mouth care at that time. This dental hygienist is no longer with the facility.

**CURRENT DAILY PROTOCOL FOR ORAL HEALTH CARE:** It is expected that the care aides provide daily mouth care for the residents 2x/daily. This includes brushing of the dentures and teeth. Some residents are able to provide their own care and are assisted as needed. Dentures are currently being removed at night and soaked overnight in either water or a denture cleansing solution. It is unknown as to what is used to brush the dentures. Some residents did have special denture cleaning pastes that could be used with a brush. Inspection of the residents rooms showed that 31/46 had at least some mouth care products, 6/46 of the residents had their products labeled (although 5 rooms that did not have labeled products were private, where labeling is not as important) and 26/31 residents who had products had them stored in a orderly, hygienic manner.

Some residents such as those on a tube-feed (2) had no mouth care products other than gauze to cleanse the mouth. Some residents had electric toothbrushes, all worked except
Almost all toothbrushes were in good condition, with many residents having multiple toothbrushes. Toothpaste ranged from plain to all-in-one, with 1 resident having Prevident toothpaste. Mouthrinse included Listerine, Scope, Listermint and 1 bottle of fluoride rinse. Dr. Nathoo sometimes prescribes chlorhexidine, but I did not see any with this inspection as it is kept at the nursing station.

Storage of mouth care supplies was good, with only some residents having the products stored in a less than ideal manner such as with pens, combs, skin care products or loose in drawers/counter tops. In rooms with more than one resident it was sometimes difficult to determine whose products belonged to who as they were unlabeled. No products for dry mouth were seen.

**WHAT THE FACILITY HOPES TO GAIN FROM THE EDUCATION PROGRAM:** A review of the current state of mouth care at the facility and improvement in any deficient areas. A review of basic mouth care as well as more information on how to provide specialized mouth care such as dry mouth, uncooperative residents and palliative care. A simple nursing assessment and an assessment yearly from a dental professional would be seen as beneficial from nursing.

**PERCEIVED BARRIERS TO THE EDUCATION PROGRAM:** None.

**PLAN FOR DAILY MOUTHCARE PROGRAM:**

1. 3 in-service sessions for all nursing staff which will address the importance of mouth care, techniques for tooth brushing, mouth cleansing, and denture care. These sessions will also touch on techniques for providing care for residents with a dry mouth, as well as those who are uncooperative and unconscious. Each session will have both theory and hands-on components and will take approximately 45 minutes.

2. 2 in-service sessions for RN’s on oral assessment. These sessions will address the importance of an oral assessment, how to perform it, how to complete the necessary documentation and how to develop an individualized oral care plan for each resident.

3. 1 in-service session on denture labeling for anyone interested. This can be nursing staff as well as clerical.

4. Attend a family council meeting to discuss the education program, review the new products and answer any questions. Distribute a pamphlet on daily mouth care for Families and Friends inviting them to help with their loved-ones daily mouth care if they wish.

5. Weekly support from the dental hygienist to address nursing staff concerns regarding mouth care. Provide individual hands-on education specific to a resident’s needs.
6. Provision of a standardized stock of mouth care products that are specific to the needs of the resident in long-term care, as well as an inventory control mechanism to track product usage and cost. Recommended products:  
   Crest Cavity Protection Toothpaste  
   Butler #409 Toothbrush  
   Butler Denture Brush  
   Denture Cup  
   Oral-B Antibacterial Mouthrinse  
   Butler Proxabrush  
   Butler Dental Floss  
   Salix Saliva Stimulator  
   Oral Balance Lubricant  
   Open Wide Mouth prop


8. Provision of Individualized Mouth care Plan Cards.

9. Labeling of resident products and dentures.

10. Audit of the program at 1 and 3 months, which will guide education and provide feedback to the staff on areas of strengths and weaknesses.
## MOUTH CARE FOR PERSONS IN RESIDENTIAL CARE SURVEY

**CODE:**

**TRUE OR FALSE? CHECK (X) YOUR ANSWER.**

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Independent residents don’t need help with daily mouth care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sweet, soft, sticky foods increase the risk of getting cavities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Tooth plaque needs to be removed daily to help prevent the residents from getting cavities and gum disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mouth rinses with alcohol are recommended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Older adults don’t need to use a fluoride toothpaste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Medication is the most common cause of a dry mouth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Dental supplies and dentures should be labeled with the resident’s name</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Unconscious residents need mouth care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Tube fed residents do not need mouth care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Residents with poor oral hygiene are more prone to tooth loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Dentures should be removed for at least a few hours a day or left out overnight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Use enough toothpaste to cover the surface of the toothbrush when brushing the teeth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. If gums bleed during tooth brushing, you should stop brushing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Foam toothettes are not as effective as a toothbrush in cleaning the teeth and mouth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Vaseline is the best thing to use to lubricate dry lips and mouths</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. A toothbrush and toothpaste are used to clean dentures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Brushing dentures cleans them better than soaking them in a cleansing solution</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. On average, how many residents do you care for on your shift? ________

3. On average, how many minutes per resident do you spend either providing mouthcare or helping them to do their own mouthcare? (Please check one)
   - 0-2
   - 3-5
   - 6-8
   - 9-11
   - 12-14

4. What BARRIERS do you face when providing mouthcare for residents? (Check ALL that apply)
   - not enough time to do it
   - residents who are uncooperative
   - don't know how to do it
   - supplies not available
   - residents have bad breath
   - does not seem to be a priority where I work
   - Other, please specify
   - I experience NO barriers

5. Use the scale below to indicate how much you agree or disagree with the following statements. (Place the corresponding number next to the statement)
   1 2 3 4 5
   Strongly agree Agree Neither Agree/Disagree Disagree Strongly Disagree
   - a. I believe residents should receive mouthcare daily
   - b. I believe residents mouths should be assessed daily, even those without teeth
   - c. I believe that daily mouthcare is an important part of the residents overall care
   - d. I believe that mouthcare should be postponed if residents are uncooperative

6. What is your position at this long-term care facility? (Please check one)
   - a. RN
   - b. LPN
   - c. RCA

Comments: ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
Appendix II

February 15, 2004

RESIDENT’S CONSENT to participate in the evaluation of a Comprehensive Daily Mouthcare Program on the oral health of residents living in a long-term care facility.

Principal Investigator: Dr. Chris Wyatt, The University of British Columbia

Co-Investigator: Ms. Leeann Donnelly, The University of British Columbia.

I consent to participate in an evaluation of a Comprehensive Daily Mouthcare Program on the oral health of residents in a long-term care facility. I understand that the purpose of the study is to evaluate if the program decreases the amount of debris and gingivitis (gum inflammation) in my mouth.

I agree to have my mouth examined by a dentist on 3 occasions over the next 6 months at no charge. The examination will require about 15 minutes and consist of a routine visual inspection of my mouth (without x-rays).

I understand that I will be advised by the dentist about problems in my mouth and provided with a list of names of dental professionals in the community for follow-up care. There are no unusual risks associated with this examination other than those that I would expect from a dental examination.

I have been assured that I am under no obligation to participate in this evaluation, and that I am free to withdraw from the evaluation at any time without consequence or concern. My refusal to participate will not in any way influence the care I receive now or in the future.

Information collected about me will be held in the strictest confidence by the investigators, and my identity will not be revealed except by a code known only to the investigators. Information I give will be stored securely in the Faculty of Dentistry at the University of British Columbia and under no
Facility Audit
Braddan Private Hospital

Products - most products available in the resident’s room for use
Labeling - with the resident’s name on the products
Storage - hygienic and orderly manner, easy for resident and staff to access
Care Plans – developed for the resident’s mouthcare and accessible to staff

Baseline: April 1, 2004

<table>
<thead>
<tr>
<th>Products</th>
<th>Labeling</th>
<th>Storage</th>
<th>Care Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>29/46</td>
<td>6/46</td>
<td>26/46</td>
<td>5/46</td>
</tr>
<tr>
<td>63%</td>
<td>13%</td>
<td>56%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Mean Debris Score: 1.90
Mean Bleeding Score: 0.03

1 Month Audit: June 1, 2004

<table>
<thead>
<tr>
<th>Products</th>
<th>Labeling</th>
<th>Storage</th>
<th>Care Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>44/46</td>
<td>42/46</td>
<td>44/46</td>
<td>42/46</td>
</tr>
<tr>
<td>96%</td>
<td>91%</td>
<td>96%</td>
<td>91%</td>
</tr>
</tbody>
</table>

Mean Debris Score: 2.22
Mean Bleeding Score: 0.03

4 Month Audit: September 10, 2004

<table>
<thead>
<tr>
<th>Products</th>
<th>Labeling</th>
<th>Storage</th>
<th>Care Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>44/46</td>
<td>42/46</td>
<td>44/46</td>
<td>42/46</td>
</tr>
<tr>
<td>96%</td>
<td>91%</td>
<td>96%</td>
<td>91%</td>
</tr>
</tbody>
</table>

Mean Debris Score: 2.01
Mean Bleeding Score: 0.01