

References: Oral Health

REF ID: 3143

Level IV: Non-experimental study

Topic 2: Prevention

Abe, S., Ishihara, K., & Okuda, K. (2001). Prevalence of potential respiratory pathogens in the mouths of elderly patients and effects of professional oral care. *Archives of Gerontology and Geriatrics*, 32(1), 45-55.

Journal Article, Research, Tables/Charts

To evaluate the effectiveness of professional oral health care in reducing the risk of aspiration pneumonia, we examined the prevalence of potential respiratory pathogens in gargled samples from elderly persons. Samples were obtained from 54 elderly subjects over 65 years of age who required daily nursing care, from 21 healthy elderly subjects over 65 years old, and from 22 healthy young subjects under 30 as controls. The prevalence of possible pathogens was determined by culture and the polymerase chain reaction. The percentages detected in samples of *Streptococcus pneumoniae*, *Staphylococcus* species, methicillin-resistant *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Candida albicans* from elderly patients requiring daily nursing care were 63.0, 37.0, 14.8, 5.6 and 66.7, respectively. The numbers of *C. albicans* cells recovered in samples from elderly subjects were significantly higher than those recovered from the healthy young group ($P < 0.001$). Elderly patients needing daily care and receiving professional oral health care had lower prevalences and cell numbers of *C. albicans* than did the elderly patients without such oral care. This study showed that professional oral health care in elderly requiring daily nursing care reduced the cell numbers of potential respiratory pathogens.

REF ID: 3254

Level II: Individual experimental study

Topic 2: Prevention

Adachi, M., Ishihara, K., Abe, S., Okuda, K., & Ishikawa, T. (2002). Effect of professional oral health care on the elderly living in nursing homes. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*, 94(2), 191-195.

Clinical Trial; Journal Article; Randomized Controlled Trial; D; IM

OBJECTIVE: We evaluated the effectiveness of professional oral health care (POHC) given by dental hygienists once a week for 24 months to 141 elderly persons needing daily care and living in 2 nursing homes. **STUDY DESIGN:** Elderly subjects with POHC and without POHC living in 2 nursing homes were examined for 24 months to detect any fevers of 37.8 degrees C or more and the prevalence of fatal aspiration pneumonia. The numbers of *Staphylococcus* species and *Candida albicans* in swab samples from oral cavities were compared between the POHC group and the non-POHC group. The amounts of methylmercaptan exhaled in the POHC group were determined and compared with those in the non-POHC group. **RESULTS:** The prevalence of fevers of 37.8 degrees C or more in the subjects receiving POHC was significantly lower than in the non-POHC group ($P < .05$). We found that the ratio of fatal aspiration pneumonia in the POHC group during the 24 months was significantly lower than in the non-POHC group ($P < .05$). Numbers of *C. albicans* species in samples obtained from the oral cavity after 6 months of POHC were significantly lower than those in the non-POHC group ($P < .01$). POHC resulted in the reduction of the presence of *Staphylococcus* but not to a statistically significant extent. The amounts of methylmercaptan exhaled by the POHC group were significantly less than those of the non-POHC group ($P < .05$). **CONCLUSION:** This study showed that POHC administered by dental hygienists to a group of elderly patients needing daily nursing care was associated with a reduction in prevalence of fever and fatal pneumonia.

REF ID: 3152

Level IV: Non-experimental study

Topic 1: Risks

Adam, H., & Preston, A. J. (2006). The oral health of individuals with dementia in nursing homes. *Gerodontology*, 23(2), 99-105.

Journal Article; D

OBJECTIVE: To determine if moderate to severe dementia has an effect on the oral health of individuals

resident in nursing homes. **BACKGROUND:** A significant proportion of the elderly population lives in nursing homes and suffers from varying degrees of dementia. Dementia might affect an individual's ability to implement oral care. Previous work in this area has focused on individuals with mild dementia living in the community setting. **MATERIAL AND METHODS:** Two matched cohorts of subjects resident in four nursing homes in Cheshire were recruited (n=135). One cohort's subjects were deemed to have no or mild dementia, whereas the other cohort's subjects were deemed to have moderate to severe dementia. Oral parameters were scored, including Decayed, Missing, Filled Teeth (DMFT) scoring, dental deposit scoring, denture assessment and the noting of any other pathology. **RESULTS:** There was a statistically significant difference in the relative level of dementia of the subjects between the two cohorts ($p < 0.01$, Student's t-test). The DMFT scores were similar for both groups. The mean number (+/-SD) of decayed and missing teeth for the no/mild dementia group was 1.11 (+/-3.42) and 28.22 (+/-6.64), whilst that of the moderate/severe dementia cohort was 0.80 (+/-1.87) and 27.28 (+/-7.73), respectively. Eleven per cent of the moderate/severe dementia cohort wore an upper denture alone as compared with 16% in the no/mild dementia group. **Conclusion:** For individuals resident in nursing homes, moderate to severe dementia might have a deleterious effect on oral health. Further work in this area is required.

REF ID: 3231

Level V: Literature review

Topic 4.5: Management-surgery

Al Jabbari, Y., Nagy, W. W., & Iacopino, A. M. (2003). Implant dentistry for geriatric patients: A review of the literature. *Quintessence International*, 34(4), 281-285.

Journal Article; Review; D

The objective of this literature review is to discuss the various parameters related to clinical success of implant treatment in geriatric patients. Old age is not a contraindication for implant therapy; however, clinicians should be aware of potential risks, possible medical complications, and psychosocial issues that affect implant prognosis in geriatric patients.

REF ID: 3150

Level V: Case report

Topic 3: Assessment

Alian, A. Y., McNally, M. E., Fure, S., & Birkhed, D. (2006). Assessment of caries risk in elderly patients using the cariogram model. *Journal of the Canadian Dental Association*, 72(5), 459-463.

Case Reports; Journal Article; D; IM

For several decades, Swedish researchers, clinicians and educators have recognized risk assessment as an important part of routine management of dental caries. Innovative caries risk assessment models, such as the Cariogram software program, have been developed to systematize the evaluation of various risk factors for caries and to develop targeted prevention interventions based on caries risk. The benefits derived from these models in terms of improving the health of high-risk groups such as older adults have not been well studied. The purpose of this article is to demonstrate the application of the Cariogram software in the management of dental care for 3 elderly patients.

REF ID: 3168

Level IV: Non-experimental study

Topic 1: Risks

Al-Shammari, K. F., Al-Khabbaz, A. K., Al-Ansari, J. M., Neiva, R., & Wang, H. L. (2005). Risk indicators for tooth loss due to periodontal disease. *Journal of Periodontology*, 76(11), 1910-1918.

Journal Article; Multicenter Study; D; IM

BACKGROUND: Several risk indicators for periodontal disease severity have been identified. The association of these factors with tooth loss for periodontal reasons was investigated in this cross-sectional comparative study. **METHODS:** All extractions performed in 21 general dental practice clinics (25% of such clinics in Kuwait) over a 30-day period were recorded. Documented information included patient age and gender, medical history findings, dental maintenance history, toothbrushing frequency, types and numbers of extracted teeth, and the reason for the extraction. Reasons were divided into periodontal disease versus other reasons in univariate and binary logistic regression analyses. **RESULTS:** A total of 1,775 patients had 3,694

teeth extracted. More teeth per patient were lost due to periodontal disease than for other reasons (2.8 +/- 0.2 versus 1.8 +/- 0.1; P 35 years (odds ratio [OR] 3.45; 95% confidence interval [CI] 2.79 to 4.26), male gender (OR 1.42; 95% CI 1.17 to 1.73), never having periodontal maintenance (OR 1.48; 95% CI 1.23 to 1.78), never using a toothbrush (OR 1.81; 95% CI 1.49 to 2.20), current or past smoking (OR 1.56; 95% CI 1.28 to 1.91), anterior tooth type (OR 3.23; 95% CI 2.57 to 4.05), and the presence of either of the following medical conditions: diabetes mellitus (OR 2.64; 95% CI 2.19 to 3.18), hypertension (OR 1.73; 95% CI 1.41 to 2.13), or rheumatoid arthritis (OR 4.19; 95% CI 2.17 to 8.11). CONCLUSION: Tooth loss due to periodontal disease is associated with the risk indicators of age, male gender, smoking, lack of professional maintenance, inadequate oral hygiene, diabetes mellitus, hypertension, rheumatoid arthritis, and anterior tooth type.

REF ID: 3129

Level V: Literature review

Topic 4: Management

Altani, A., & Wyatt, C. C. L. (2002). Oral hygiene and institutionalized elders. *Probe*, 36(3), 91-2, 93-6. Journal Article, Pictorial, Research

The oral hygiene of institutionalized elders is poor. This population exhibits an increased risk of oral infections such as periodontal disease, caries, inflammatory mucosal disorders, and denture-related problems. Poor oral health has been associated with systemic infections, such as respiratory infections, and nutritional inadequacies. Thus the maintenance of oral health among institutionalized elders is of significant value as it has an impact on general health and quality of life. Considerable literature, however, indicates that institutionalized elders have limited access to professional oral health care services. As well, the primary caregivers, the care aides, face many barriers to providing daily oral hygiene, barriers such as time constraints and limited training in oral hygiene practices. Oral hygiene in-service training programs provided by a dental hygienist can raise the profile of oral health within the institution, support the integration of oral health care into the overall care of residents, and provide caregivers with an opportunity to be educated about daily mouth care. Dental hygienists have the education and skills that enable them to identify the oral care needs of the residents and to act as consultants for oral health policy, procedure, and program development within institutions.

REF ID: 3200

Level V: Literature review

Topic 1: Risks

Amella, E. J. (2004). Feeding and hydration issues for older adults with dementia. *The Nursing Clinics of North America*, 39(3), 607-623.

Journal Article; Review; AIM; IM; N

All cultures dictate the need to feed the hungry and create rituals for almost every life passage around the consumption of food and beverage. Yet, in old age and among those who cannot advocate for themselves, mealtime is medicalized and demoted to an insignificant event without dignity or regard for individualized needs. Attention must be paid to not only what people eat, but how they eat, and how they are supported in that process. Kayser-Jones summarized the extensive findings of several ethnographic studies in nursing homes by noting the multi-factorial issues involved in delivering excellent care to all residents, especially those lacking an advocate. Her findings exposed how lack of staff education, inadequate staffing and supervision, disregard for personal and cultural preferences, lack of assessment for comorbid health problems, intake of food and fluids, dysphagia, and oral health problems all contributed to malnutrition and dehydration among the residents studied. This seminal set of studies, along with Dr. Kayser-Jones' testimony in US Congressional hearings directly affected the design of federal regulatory protocols to address malnutrition and dehydration. In an attempt to increase the number of staff available to assist at meals, the Centers for Medicare and Medicaid issued a change in regulations on Sept. 26, 2003, allowing reimbursement for staff trained for a total of 8 hours to act as feeding assistants. This change is intended to, "provide more residents with help in eating and drinking and reduce the incidence of unplanned weight loss and dehydration". Although seen as answering some of the staffing ratio issues at meal times, this rule change has been criticized for not addressing the complexities of resident needs at meal times. Although offering food and fluid is time-consuming and requires special knowledge of physiological changes and empathy for persons whose behavior

might be objectionable at times, it may be one of the few times during the day that the individual with dementia receives normalized social interaction. Thus, as in the care of all vulnerable persons with dementia, whether at home or in an institution, perhaps the greatest challenge and need is for nurses and other caregivers to provide a social environment that promotes individual dignity and comfort.

REF ID: 3123

Level IV: Non-experimental study

Topic 3: Assessment

Andersson, P., Halberg, I. R., Lorefalt, B., Unosson, M., & Renvert, S. (2004). Oral health problems in elderly rehabilitation patients. *International Journal of Dental Hygiene*, 2(2), 70-77.

Journal Article, Research, Tables/Charts

A combination of poor oral hygiene and dry mouth may be hazardous to the oral health status. However, systematic assessments in order to detect oral health problems are seldom performed in the nursing care of the elderly. The aims of this study were to investigate the occurrence of oral health problems measured using the Revised Oral Assessment Guide (ROAG) and to analyse associations between oral health problems and age, gender, living conditions, cohabitation, reason for admission, number of drugs, and functional and nutritional status. One registered nurse performed oral health assessments using ROAG in 161 newly admitted elderly patients in rehabilitation care. Oral health problems were found in 71% of the patients. Thirty per cent of these patients had between four and eight problems. Low saliva flow and problems related to lips were the most frequent oral health problems. Problems in oral health status were significantly associated with presence of respiratory diseases (problems with gums, lips, alterations on the tongue and mucous membranes), living in special accommodation (low saliva flow, problems with teeth/dentures and alterations on the tongue), being undernourished (alterations on the tongue and low saliva flow) and being a woman (low saliva flow). The highest Odds ratio (OR) was found in problems with gums in relation with prevalence of respiratory diseases (OR 8.9; confidence interval (CI) 2.8-27.8; $P < 0.0005$). This study indicates the importance of standardised oral health assessments in order to detect oral health problems which can otherwise be hidden when the patients are admitted to the hospital ward.

REF ID: 3191

Level IV: Non-experimental study

Topic 3: Assessment

Andersson, P., Hallberg, I. R., & Renvert, S. (2003). Comparison of oral health status on admission and at discharge in a group of geriatric rehabilitation patients. *Oral Health.Prev.Dent.*, 1(3), 221-228.

Journal Article; D; IM

PURPOSE: The aim of this study was to compare oral health status on a geriatric rehabilitation ward among patients who were assessed using the Revised Oral Assessment Guide (ROAG) on admission and at discharge; and to investigate in what respect the oral health procedures (OHP) suggested in ROAG were applied when oral health problems were detected. **MATERIALS AND METHODS:** Registered nurses on the ward performed oral health assessments using ROAG with 107 patients on admission and at discharge. When oral health problems were detected measures to be taken were suggested using ROAG. **RESULTS:** Oral health problems were common among the patients on admission (86%), as well as at discharge (51%). The frequency of the problems was significantly lower at discharge compared to admission. The OHP that were recommended in ROAG were completely followed when saliva flow-related problems were detected. Regarding other oral health problems, measures other than the recommended ones were often performed. **CONCLUSION:** This study demonstrated that the oral health was better at the end of the hospital stay compared to admission.

REF ID: 3126

Level IV: Non-experimental study

Topic 3: Assessment

Andersson, P., Westergren, A., Karlsson, S., Hallberg, I. R., & Renvert, S. (2002). Oral health and nutritional status in a group of geriatric rehabilitation patients. *Scandinavian Journal of Caring Sciences*, 16(3), 311-318.

Journal Article, Research, Tables/Charts

The aims of this study were to evaluate the oral health status and nutritional status in a group of geriatric rehabilitation patients, and to analyse the relationship between these two parameters. Nurses at the ward performed structured assessments of oral and nutritional status using the Revised Oral Assessment Guide and the Subjective Global Assessment form in 223 newly admitted patients. Most oral health problems were found among patients who stayed longer at the hospital and were more dependent on help as compared with the healthier patients. Thirty-four per cent of the patients were either severely undernourished, at risk or suspected to be undernourished (UN). Oral health problems were more common among UN patients ($p < 0.0005$) compared with well-nourished patients. The most frequent oral health problem was found on teeth or dentures (48%). Problems related to the tongue and lips were also common among UN patients (56 and 44%, respectively). Oral health status was correlated ($r = 0.32$) to nutritional status. Problems with swallowing had the strongest association to the nutritional status (OR 6.05; 95% CI 2.41-15.18). This study demonstrated that poor oral health status was related to undernourishment.

REF ID: 3210

Level IV: Non-experimental study

Topic 1: Risks

Arai, K., Sumi, Y., Uematsu, H., & Miura, H. (2003). Association between dental health behaviours, mental/physical function and self-feeding ability among the elderly: A cross-sectional survey.

Gerodontology, 20(2), 78-83.

Journal Article; D

OBJECTIVES: The aim of this study was to determine the association between dental health behaviour, mental/physical function and self-feeding ability among the elderly. **SUBJECTS:** A total of 414 elderly dental patients aged 65 years and older participated in this study. **METHODS:** A survey was carried out for three years and seven months starting in January 1998 at the Chubu National Hospital. The patients or their carers were examined/interviewed about the severity of senile dementia, dental health behaviour, ability to rinse their mouths, ability to manage dentures, and ability to sit at a table during meals. To assess the association with self-feeding ability among the elderly, cut-offs were given for these variables, and then the odds ratios were calculated. **RESULTS:** The strongest association to self-feeding ability was marked by inability to rinse their own mouth, followed by inability to manage dentures, inability to sit at a table during meals, severe senile dementia and less frequency of toothbrushing. **CONCLUSION:** Elderly who have lost the feeding ability often could not maintain their dental health by themselves. Carers must provide not only a feeding service with acknowledgement of aspiration but oral care to prevent dental disease and fatal pneumonia in the elderly.

REF ID: 3108

Level IV: Non-experimental study

Topic 1: Risks

Avcu, N., Ozbek, M., Kurtoglu, D., Kurtoglu, E., Kansu, O., & Kansu, H. (2005). Oral findings and health status among hospitalized patients with physical disabilities, aged 60 or above. *Archives of Gerontology and Geriatrics, 41(1), 69-79.*

Journal Article, Research, Tables/Charts

The purpose of the study was to determine oral health status and the prevalence of oral mucosal lesions among hospitalized elderly patients with physical disabilities. The study group consisted of 111 (43 male and 68 female) elderly patients with physical disabilities. Clinical examination and interview methods were employed. Clinical examination revealed that 45.9% of the elderly patients had one or more oral mucosal lesions. Xerostomia (58.6%), coated-hairy tongue (54.1%) and halitosis (46.8%) were the most frequently encountered oral findings and mucosal lesions. As the most interesting finding discovered in elderly patients, macroglossia (30.6%) seems to depend on physical disability. Coated or hairy tongue was commonly related to poor oral hygiene, with both crude odds ratio (OR) of 3.25 (95% CI: 1.26-8.36) ($P=0.021$) and the logistic regression OR of 3.36 (95% CI: 1.21-9.33) ($P=0.020$). Halitosis and bruxism were commonly related to dentate patients [logistic regression OR of 0.29 (95% CI: 1.12-0.74) ($P=0.009$) and 0.21 (95% CI: 0.06-0.74) ($P=0.016$); respectively]. Increase in dental problems may have negative impacts on chewing, nutrition, aesthetics and phonation in elderly patients. It is particularly noteworthy that physical disability in elderly patients limits their ability to effectively follow oral hygiene procedures.

REF ID: 3076

Level IV: Non-experimental study

Topic 1: Risks

Avlund, K., HolmPedersen, P., Morse, D. E., Viitanen, M., & Winblad, B. (2003). Social relations as determinants of oral health among persons over the age of 80 years. *Community Dentistry and Oral Epidemiology*, 31(6), 454-462.

Journal Article, Research, Tables/Charts

Objective: To analyze whether social relations during a 7-year follow-up influence oral health among generally healthy, community-dwelling persons over the age of 80 years. Method: The present investigation is based on a subsample of 129 dentate community-dwelling individuals from The Kungsholmen Elders Oral Health Study (KEOHS), which included data from interviews and oral examinations. Social relations were measured in terms of marital status, living alone, frequency of contacts, number of confidants, and satisfaction with social contacts and with the frequency of contacts. Oral health was measured in terms of coronal caries and root caries. Results: The primary findings of the adjusted multivariate logistic regression analysis were that persons who lived alone or who became alone during the 7 years prior to the dental examination had greater odds of having coronal caries (odds ratio (OR): 2.4, 95% CI: 1.0-5.7) than those who continually lived with others, and that persons who were continuously dissatisfied with the frequency of their social contacts were more likely to have root caries than those who reported a sustained satisfaction with the frequency of their social contacts (OR: 2.9, 95% CI: 1.2-7.2). Conclusion: This study suggests that social relations are related to the oral health status of old-old individuals. From a psychosocial perspective, our findings contribute to a deeper understanding of the background of oral health status in older adults.

REF ID: 3134

Level IV: Non-experimental study

Topic 3: Assessment

Avlund, K., HolmPedersen, P., & Schroll, M. (2001). Functional ability and oral health among older people: A longitudinal study from age 75 to 80. *Journal of the American Geriatrics Society*, 49(7), 954-962.

Journal Article, Research, Tables/Charts

OBJECTIVE: To examine whether functional ability at age 75 and age 80 is associated with oral health and use of dental services cross-sectionally and whether changes in functional ability from age 75 to age 80 are associated with oral health and regular use of dental services at age 80. DESIGN: The study included a random sample of 75-year-olds at baseline and a follow-up study 5 years later. The data are treated as two cross-sectional studies at age 75 and 80, respectively, and as a longitudinal study from age 75 to 80. SETTING: The western part of Copenhagen County. PARTICIPANTS: The two cross-sectional studies of 75- and 80-year-old people included 411 and 321 persons, respectively. The longitudinal study from age 75 to 80 included the 326 persons who participated in both surveys. MEASUREMENTS: Oral health status was measured roughly by number of teeth and chewing ability. Use of dental services was measured by frequency of visits to a dentist or denturist. Functional ability was measured by two scales on mobility in relation to tiredness and need of help. Changes in mobility from age 75 to 80 is described as (1) improved or sustained good, (2) decreased, and (3) sustained poor. Gender, chronic diseases, self-rated health, socio-demographic factors, living alone, and social relations were included as possible confounders. RESULTS: The odds ratio of having no or few teeth was 1.7 (1.1-2.6) in 75-year-old individuals who felt tired in mobility, 1.7 (1.0-2.9) in 80-year-old persons who needed help with mobility, and 2.7 (0.94-7.5) in persons with sustained need of help with mobility from age 75 to 80. The odds ratio of chewing difficulties was 1.7 (1.1-2.8) in 80-year-old people in need of help, and 1.8 (1.1-3.0) in persons age 75 to 80 needing sustained help. Dentate 80-year-old persons who felt tired in mobility had an odds ratio of 2.0 (0.94-4.2) of not using dental services. CONCLUSIONS: The results indicate that oral impairment (e.g., having no or few teeth), oral functional limitations (e.g., chewing problems), and general functional limitations (e.g., mobility problems) are interrelated and that prevention of disabilities should be aimed at both functional limitations and oral health problems if the intention is to promote a good life in old age. In addition, the results point to the importance of taking

problems in mobility seriously in delivering preventive services to old people because people who are tired or dependent on help seem to be at a higher risk of not using dental services regularly.

REF ID: 3218

Level II: Individual experimental study

Topic 4.4: Management-Products

Awad, M. A., Lund, J. P., Shapiro, S. H., Locker, D., Klemetti, E., & Chegade, A. et al. (2003). Oral health status and treatment satisfaction with mandibular implant overdentures and conventional dentures: A randomized clinical trial in a senior population. *The International Journal of Prosthodontics*, 16(4), 390-396.

Clinical Trial; Journal Article; Randomized Controlled Trial; D

PURPOSE: The purpose of this study was to compare elderly patients' satisfaction and oral health-related quality of life with mandibular two-implant overdentures and conventional dentures. **MATERIALS AND METHODS:** Sixty edentulous subjects aged 65 to 75 years were randomly assigned to two groups treated with maxillary conventional dentures and either a mandibular conventional denture (n = 30) or an overdenture supported by two implants with ball retainers (n = 30). Subjects rated their general satisfaction, as well as other features of their dentures (comfort, stability, ability to chew, speech, esthetics, and cleaning ability), prior to treatment and 2 months postdelivery. Changes in ratings on the original Oral Health Impact Profile (OHIP) and its short form (OHIP-EDENT) were also used as indicators of oral health-related quality of life. **RESULTS:** The primary outcome of this study, ratings of general satisfaction 2 months postdelivery, was significantly better in the group treated with mandibular two-implant overdentures (P = .001). In addition, the implant group gave significantly higher ratings on comfort, stability, and ability to chew. Furthermore, using OHIP-EDENT, subjects who received mandibular two-implant overdentures had significantly fewer oral health-related quality of life problems than did the conventional group. **CONCLUSION:** These short-term results suggest that mandibular two-implant overdentures combined with maxillary conventional dentures provide better function and oral health-related quality of life than conventional dentures.

REF ID: 3198

Level I: Systematic Review

Topic 2: Prevention

Axelsson, S., Soder, B., Nordenram, G., Petersson, L. G., Dahlgren, H., & Norlund, A. et al. (2004). Effect of combined caries-preventive methods: A systematic review of controlled clinical trials. *Acta Odontologica Scandinavica*, 62(3), 163-169.

Journal Article; Meta-Analysis; Review; D; IM

The aim of this systematic review was to evaluate the caries-preventive effect of combined caries-preventive methods, defined as two or more different interventions in combination, each expected to prevent dental caries. The Medline database was searched for articles published in the period January 1966 to June 2003. Twenty-four controlled studies met the inclusion criteria, and their value as evidence was assessed according to predetermined criteria. The level of evidence for the overall conclusion regarding each method was graded according to the protocol of the Swedish Council on Technology Assessment in Health Care. The scientific evidence for the combination of treatments involving fluoride that had a preventive effect on caries in children and adolescents was graded as moderate. However, for elderly patients the scientific evidence for the caries-preventive effect of different combinations of treatments was found to be incomplete. No conclusion could be drawn regarding the evidence for combinations of treatments being effective for groups at high caries risk, as the results from the identified clinical studies were conflicting.

REF ID: 3175

Level V: Literature review

Topic 4: Management

Bailey, R., Gueldner, S., Ledikwe, J., & Smiciklas-Wright, H. (2005). The oral health of older adults: An interdisciplinary mandate. *Journal of Gerontological Nursing*, 31(7), 11-17.

Journal Article; Review; N

REF ID: 3099

Level IV: Non-experimental study

Topic 1: Risks

Bailey, R. L., Ledikwe, J. H., SmiciklasWright, H., Mitchell, D. C., & Jensen, G. L. (2004). Persistent oral health problems associated with comorbidity and impaired diet quality in older adults [corrected] [published erratum appears in J AM DIET ASSOC 2004 oct;104(10):1548]. *Journal of the American Dietetic Association*, 104(8), 1273-1276.

Journal Article, Research, Tables/Charts

Chewing, swallowing, and mouth pain (CSP) are identified as indicators of nutritional risk in older adults. Previous research has shown that oral health problems in community-living older rural adults were associated with increased hospitalization. The purpose of this study was to characterize older adults with self-reported persistent CSP problems at baseline and one-year follow-up. Participants were from the Geisinger Rural Aging Study, either with persistent oral problems (PCSP; n=22) or without problems (NCSP; n=125). Demographic, health, and anthropometric data were collected via home visit; diet information was assessed by five, 24-hour recalls collected over 10 months. PCSP subjects reported almost twice the number of medications (4.2 vs 2.6, respectively, P=.008) and diseases (7.0 vs 4.2, respectively, P=.001), with higher occurrence of type 2 diabetes mellitus, peptic ulcers/gastritis, and angina. PCSP participants had lower Healthy Eating Index scores (66.6 vs 70.6, respectively, P=.04), significantly lower intakes of vitamin A, and higher prevalence of inadequate intakes of vitamins B-6 and A. These results indicate that impaired intake of certain foods and nutrients is associated with persistent oral health problems. Oral status is an important component of overall health and should be monitored for intervention.

REF ID: 3251

Level V: Literature review

Topic 4: Management

Bassichis, B. A., & Marple, B. F. (2002). Dry mouth and nose in the older patient. what every PCP should know. *Geriatrics*, 57(10), 22-4, 29, 32 passim.

Journal Article; Review; AIM; IM

Dry mouth and dry nose are common complaints among the older population. Dry mouth can be attributed to medical conditions and other underlying causes, whereas dry nose is usually associated with age-related changes in nasal physiology and structure. In both cases, medications can contribute to dryness, so a proper evaluation includes a careful drug review. Management of dry mouth includes hydration and use of mouthwash, sugarless gum, candy, and saliva substitutes. Dry nose can be managed with nasal sprays that moisten the nasal cavity.

REF ID: 3145

Level I: Systematic Review

Topic 4: Management

Beirne, P., Forgie, A., Clarkson, J. E., & Worthington, H. V. (2006). Recall intervals for oral health in primary care patients. *Cochrane Database of Systematic Reviews*, 3

Systematic Review

Background The frequency with which patients should attend for a dental check-up and the potential effects on oral health of altering recall intervals between check-ups have been the subject of ongoing international debate for almost 3 decades. Although recommendations regarding optimal recall intervals vary between countries and dental healthcare systems, 6-monthly dental check-ups have traditionally been advocated by general dental practitioners in many developed countries. **Objectives** To determine the beneficial and harmful effects of different fixed recall intervals (for example 6 months versus 12 months) for the following different types of dental check-up: a) clinical examination only; b) clinical examination plus scale and polish; c) clinical examination plus preventive advice; d) clinical examination plus preventive advice plus scale and polish. To determine the relative beneficial and harmful effects between any of these different types of dental check-up at the same fixed recall interval. To compare the beneficial and harmful effects of recall intervals based on clinicians' assessment of patients' disease risk with fixed recall intervals. To compare the beneficial and harmful effects of no recall interval/patient driven attendance (which may be symptomatic) with fixed recall intervals. **Search strategy** We searched the Cochrane Oral Health Group Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE and EMBASE. Reference lists from relevant articles

were scanned and the authors of some papers were contacted to identify further trials and obtain additional information. Date of most recent searches: 9th April 2003. Selection criteria Trials were selected if they met the following criteria: design - random allocation of participants; participants - all children and adults receiving dental check-ups in primary care settings, irrespective of their level of risk for oral disease; interventions - recall intervals for the following different types of dental check-ups: a) clinical examination only; b) clinical examination plus scale and polish; c) clinical examination plus preventive advice; d) clinical examination plus scale and polish plus preventive advice; e) no recall interval/patient driven attendance (which may be symptomatic); f) clinician risk-based recall intervals; outcomes - clinical status outcomes for dental caries (including, but not limited to, mean dmft/DMFT, dmfs/DMFS scores, caries increment, filled teeth (including replacement restorations), early carious lesions arrested or reversed); periodontal disease (including, but not limited to, plaque, calculus, gingivitis, periodontitis, change in probing depth, attachment level); oral mucosa (presence or absence of mucosal lesions, potentially malignant lesions, cancerous lesions, size and stage of cancerous lesions at diagnosis). In addition the following outcomes were considered where reported: patient-centred outcomes, economic cost outcomes, other outcomes such as improvements in oral health knowledge and attitudes, harms, changes in dietary habits and any other oral health-related behavioural change. Data collection and analysis Information regarding methods, participants, interventions, outcome measures and results were independently extracted, in duplicate, by two authors. Authors were contacted, where deemed necessary and where possible, for further details regarding study design and for data clarification. A quality assessment of the included trial was carried out. The Cochrane Oral Health Group's statistical guidelines were followed. Main results Only one study (with 188 participants) was included in this review and was assessed as having a high risk of bias. This study provided limited data for dental caries outcomes (dmfs/DMFS increment) and economic cost outcomes (reported time taken to provide examinations and treatment). Authors' conclusions There is insufficient evidence from randomised controlled trials (RCTs) to draw any conclusions regarding the potential beneficial and harmful effects of altering the recall interval between dental check-ups. There is insufficient evidence to support or refute the practice of encouraging patients to attend for dental check-ups at 6-monthly intervals. It is important that high quality RCTs are conducted for the outcomes listed in this review in order to address the objectives of this review.

REF ID: 3186

Level II: Individual experimental study

Topic 4: Management

Bellomo, F., de Preux, F., Chung, J. P., Julien, N., Budtz-Jorgensen, E., & Muller, F. (2005). The advantages of occupational therapy in oral hygiene measures for institutionalised elderly adults. *Gerodontology*, 22(1), 24-31.

Clinical Trial; Journal Article; Randomized Controlled Trial; D

OBJECTIVE: To investigate a new method in teaching and supervising tooth and denture brushing activities by employing occupational therapy techniques. **MATERIALS AND METHODS:** Sixty-one residents, 44 women and 17 men, with an average age of 85.7 +/- 6.6 years (range 72-97 years) living in a Long-Term Care home (LTC) in Geneva were enrolled in a randomised controlled trial. They were divided at random into experimental (EG) and control groups (CG) with matched age and sex distribution. Two subjects passed away during the 3-month experimental period. Following medical history, plaque scores and tooth brushing habits were evaluated within the context of a comprehensive clinical assessment. Furthermore, a Mini Mental State and a vision test were taken. Based on the results of these health assessments both the EG and the CG were divided into an 'assisted' (IA) and an 'independent' (II) subgroup. In the EG, tooth brushing was initially taught and in the IA monitored and re-educated once a week by an occupational therapist. In contrast, the CG-IA group received a weekly placebo activity such as manicure by the same person. **RESULTS:** From the individual movements taught and monitored by the occupational therapist, opening a tube of toothpaste (n.s.) and denture brushing ($p < 0.05$) were performed more independently after 3 months. Both the occupational therapy and the placebo activity led to a significant improvement in oral ($p < 0.01$ and 0.05) and in denture hygiene ($p < 0.001$ and 0.05). From all participants, the EG-IA subgroup presented the most significant amelioration in plaque ($p < 0.01$) and denture hygiene scores ($p < 0.001$). This group consisted mostly of subjects with an impaired cognitive state. **CONCLUSIONS:** Despite the marked placebo effect, the results

indicate that occupational therapy is particularly useful to improve the oral and denture hygiene in dependent and cognitively impaired LTC residents and may promote their autonomy in the execution of activities of daily life such as denture brushing.

REF ID: 3171

Level I: Systematic review

Topic 3: Assessment

Blicher, B., Joshipura, K., & Eke, P. (2005). Validation of self-reported periodontal disease: A systematic review. *Journal of Dental Research*, 84(10), 881-890.

Journal Article; Review; Validation Studies; D; IM

Self-report is an efficient and accepted means of assessing many population characteristics, risk factors, and diseases, but has rarely been used for periodontal disease (chronic periodontitis). The availability of valid self-reported measures of periodontal disease would facilitate epidemiologic studies on a much larger scale, allow for integration of new studies of periodontal disease within large ongoing studies, and facilitate lower-cost population surveillance of periodontitis. Several studies have been conducted to validate self-reported measures for periodontal disease, but results have been inconsistent. In this report, we conducted a systematic review of the validation studies. We reviewed the 16 studies that assessed the validity of self-reported periodontal and gingivitis measures against clinical gold standards. Seven of the studies included self-reported measures specific to gingivitis, four included measures only for periodontitis, and five included both gingivitis and periodontal measures. Three of the studies used a self-assessment method where they provided the patient with a detailed manual for performing a self-exam. The remaining 13 studies asked participants to self-report symptoms, presence of periodontal disease itself, or their recollection of a dental health professional diagnosing them or providing treatment for periodontal disease. The review indicates that some measures showed promise, but results varied across populations and self-reported measures. One example of a good measure is, "Has any dentist/hygienist told you that you have deep pockets?", which had a sensitivity of 55%, a specificity of 90%, positive predictive value of 77%, and negative predictive value of 75% against clinical pocket depth. Higher validity could be potentially obtained by the use of combinations of several self-reported questions and other predictors of periodontal disease.

REF ID: 3116

Level IV: Non-experimental study

Topic 1: Risks

Borrell, L. N., Burt, B. A., Neighbors, H. W., & Taylor, G. W. (2004). Social factors and periodontitis in an older population. *American Journal of Public Health*, 94(5), 748-754.

Journal Article, Research, Tables/Charts

OBJECTIVES: We assessed the prevalences of periodontitis by education and income levels among US adults with data from the third National Health and Nutrition Examination Survey. **METHODS:** The study was limited to non-Hispanic Blacks, Mexican Americans, and non-Hispanic Whites 50 years of age or older with a complete periodontal assessment during the dental examination. **RESULTS:** Blacks with higher education and income levels had a significantly higher prevalence of periodontitis than their White and Mexican-American counterparts. The relationship between income level and periodontitis was modified by race/ethnicity. High-income Blacks exhibited a higher prevalence of periodontitis than did low-income Blacks and high-income Whites. **CONCLUSIONS:** Our findings call attention to the importance of recognizing socioeconomic status-related health differences across racial/ethnic groups within the social, political, and historical context.

REF ID: 3061

Level V: Case report

Topic 3: Assessment

Boyce, B. M., DeBiase, C. B., Adams, B. L., & Carter, M. W. (2006). Oral health care practices and perceptions among nursing home residents: A case study. *Journal of Dental Hygiene*, 80(1), 1.

Journal Article, Abstract, Research

Purpose. Currently, little knowledge exists about the extent to which: 1) nursing home residents perceive their oral health care as being adequate, 2) nursing home residents' perceptions and actual oral health status are congruent, and 3) oral health care outcomes and residents' perceptions of their own oral health care are

influenced by levels of physical functioning. The purpose of this study was to evaluate the oral health practices and perceptions of oral health care among cognitively intact nursing home residents. Methods and Materials. Institutional review board approval was obtained, and a modified, one-shot case study design,* a 20-question resident interview, and a 10-category oral health care evaluation were utilized in three encounters with the accepting sample of 10 West Virginia nursing home residents. The interview identified each participant's current and past oral health care practices, perceptions about their current oral practices, and levels of need and functioning in the nursing home. The evaluation assessed the current oral health status of the participants. A licensed West Virginia dentist was present during the evaluations. Results. All participants (N = 10) completed the assessments. Data analyses, including percentages, frequencies, and measures of dispersion, were conducted using the JMP program, version 3. Conclusions. Conclusions that may be drawn from this study include: 1) study participants who are dependent on the nursing home staff for oral health care needs are most likely to receive oral health care, 2) the quality of oral health care performed by the nursing home staff or resident is lower than the current oral health care standards and recommendations, and 3) study participants' barriers for oral health care were commonly influenced by their physical functioning. *A modified, one-shot case study is a descriptive analysis of a particular group of individuals within one setting that reflects moderation, apparent in this study by three discrete visits to the participating nursing home.

REF ID: 3243

Level II: Individual experimental study

Topic 4.3: Management-products

Brailsford, S. R., Fiske, J., Gilbert, S., Clark, D., & Beighton, D. (2002). The effects of the combination of chlorhexidine/thymol- and fluoride-containing varnishes on the severity of root caries lesions in frail institutionalised elderly people. *Journal of Dentistry*, 30(7-8), 319-324.

Clinical Trial; Journal Article; Randomized Controlled Trial; D; IM

OBJECTIVES: To compare the clinical effects of a fluoride-containing varnish (Fluor-Protector) in combination with a chlorhexidine-containing varnish (Cervitec) on existing root caries lesions in a group of frail elderly subjects. **METHODS:** A randomised double blind longitudinal study was utilised. Subjects (n = 102) were randomly allocated to a Test or Placebo group. All leathery and soft root caries lesions in all subjects were coated with Fluor-Protector while the lesions in the Test group were also coated with Cervitec and the lesions in the Placebo group were coated with a Placebo varnish. Treatments were repeated five times in a 12-month period. Clinical parameters associated with root caries, measurements of individual lesions and salivary levels of caries associated bacteria were made at intervals. **RESULTS:** The clinical severity of the lesions in the Test group did not change significantly during the 12-month study period. In the Placebo group the mean lesion width and lesion height and length of exposed root increased significantly and the lesions were significantly closer to the gingival margin. There were no significant changes in the salivary levels of caries-associated microorganisms after 12 months although, in both groups, there was initially a significant reduction in the salivary levels of mutans streptococci. **CONCLUSIONS:** The combination of Fluor-Protector and Cervitec is a useful, simple, quick and non-invasive method for the control and management of existing root caries lesions. The procedure could be performed by a dental hygienist and may be usefully applied in other high-risk groups including persons with Parkinson's disease, debilitating neuromuscular conditions and dry mouth from whatever cause.

REF ID: 3215

Level IV: Non-experimental study

Topic 1: Risks

Brindley, M. J., Longman, L. P., Randall, C., & Field, E. A. (2003). Drug profile of adult patients attending five general dental practices in merseyside: Oral side-effects and potential interactions with dentally prescribed medication. *Primary Dental Care : Journal of the Faculty of General Dental Practitioners (UK)*, 10(4), 113-118.

Journal Article; Multicenter Study; D

OBJECTIVE: To evaluate the drug profile of patients attending general dental practice and to assess the significance of this for the provision of dental care. **DESIGN AND SETTING:** Prospective study of adult patients attending five general dental practices in Merseyside. **MATERIALS AND METHODS:** Patients were

questioned about prescribed medication. The data were analysed to assess any potential oral side-effects, pertinent drug interactions, or potential complications of dental treatment. RESULTS: A total of 1103 patients were recruited; of these, 287 (26%) were taking systemic medication. CONCLUSION: Approximately a quarter of dental patients attending for routine dental care were taking prescribed medication. The majority of these drugs have significant implications for the general dental practitioner.

REF ID: 3217

Level VI: Opinion

Topic 2: Prevention

Brunton, P. A., & Kay, E. J. (2003). Prevention. part 6: Prevention in the older dentate patient. *British Dental Journal*, 195(5), 237-241.

Journal Article; D; IM

REF ID: 3269

Level V: Literature review

Topic 4.4: Management-Products

Bryant, S. R., & Zarb, G. A. (2002). Outcomes of implant prosthodontic treatment in older adults. *Journal of the Canadian Dental Association*, 68(2), 97-102.

Journal Article; Review; D; IM

Older adults are expected to account for an increasingly disproportionate number of individuals needing oral implant prostheses. However, this biotechnology was initially studied for predominantly middle-aged edentulous patients, not elderly people. High rates of success and minimal crestal bone loss have been reported for oral implants mainly in this group. The results of studies at the University of Toronto now clearly support earlier reports that older adults respond to oral implants in the same manner as younger adults, despite their tendency for systemic illness, including osteoporosis. However, unfavourable jawbone quantity and quality, particularly atrophy of the maxilla, impaired implant success. Furthermore, placement of implants in sites that had been edentulous for shorter periods was associated with greater crestal bone loss, a finding that may have implications for younger adults undergoing such treatment. The major decision-making challenge in managing depleted dentitions and complete edentulism in an aging society now lies in differentiating the treatment outcomes, especially patient-mediated assessments (including economic analyses), of the various prosthodontic options available for older adults.

REF ID: 3270

Level V: Literature review

Topic 1: Risks

Budtz-Jorgensen, E., Chung, J. P., & Rapin, C. H. (2001). Nutrition and oral health. *Best Pract.Res.Clin.Gastroenterol.*, 15(6), 885-896.

Journal Article; Review; IM

Reduced chewing function in community-dwelling older people with adequate general health is linked to having fewer than 20 teeth present or to wearing removable dentures. By chewing for longer periods of time or swallowing larger food particles they are normally able to compensate for the impaired function. The masticatory function can be restored by adequate prosthetic therapy, which results in increased activity of the masticatory muscles during chewing and reduces the chewing time and the number of chewing strokes until swallowing. In frail or dependent elderly people undernutrition is prevalent because of health problems, reduced appetite and poor quality of life. Poor oral health and xerostomia are often associated with a reduced body mass index and serum albumin level and the avoidance of difficult-to-chew foods. Maintenance or re-establishment of masticatory function is an integral part of the medical health care of these patients, with the aim of improving their nutritional status and quality of life.

REF ID: 3093

Level IV: Non-experimental study

Topic 3: Assessment

Buhlin, K., Gustafsson, A., Andersson, K., Hakansson, J., & Klinge, B. (2002). Validity and limitations of self-reported periodontal health. *Community Dentistry and Oral Epidemiology*, 30(6), 431-437.

Journal Article, Research, Tables/Charts

OBJECTIVES: To study the agreement between self-reported dental conditions and clinical findings in an adult population (20-84 years of age), and thus evaluate questionnaires as a tool in epidemiological studies of oral health, in general, and periodontal health, in particular. **MATERIAL AND METHODS:** A questionnaire was sent to 900 randomly selected subjects in the age groups 20-29, 50-59 and 75-84 years. Of these, 723 subjects (81.0%) answered the questionnaire and 20% of them underwent a clinical examination. **RESULTS:** As regards the remaining teeth, there was a mean difference of 1.4 teeth between the number indicated in the questionnaire and that found on the clinical examination. This difference was most marked in the older subjects. Eight of the nine subjects with removable dentures reported in their answers that they had removable dentures. Periodontal variables - we found significantly more subjects with pathological gingival pockets among those who stated that they had pockets than among those who answered that they did not ($P = 0.01$; chi-square independent test). Gingival bleeding was common in those who answered 'Yes' than in those who answered 'No' to the question concerning bleeding gums. This difference was significant ($P = 0.05$; chi-square independent test) in the three age groups. However, there was no correlation between the questionnaires and the clinical examination concerning tooth mobility. **CONCLUSION:** Questionnaires concerning oral status are valid concerning the number of remaining teeth and use of removable dentures. They are less reliable about specific periodontal variables, but can still become a valuable tool for epidemiological studies of periodontal health.

REF ID: 3213

Level II: Individual experimental study

Topic 4.3: Management-medication

Cannon, P. D., & Dharmar, V. T. (2003). Minor oral surgical procedures in patients on oral anticoagulants--a controlled study. *Australian Dental Journal*, 48(2), 115-118.

Clinical Trial; Controlled Clinical Trial; Journal Article; D; IM

BACKGROUND: Patients on therapeutic anticoagulation are at risk of bleeding from minor oral surgical sites. When the anticoagulant regime is modified to prevent the risk of bleeding, this at the same time predisposes the patient to risks of the medical condition for which they are being treated. **METHODS:** A total of 70 patients who were on warfarin treatment requiring minor oral surgical procedures were treated in the Oral Surgery Department. A control group of 35 had their warfarin stopped prior to the minor oral surgical procedure. The other 35 formed the study group. Patients with an International Normalized Ratio outside the therapeutic range of 2-4, or with history of liver disease or on drugs affecting liver function were excluded from the study. Any incidences of post-operative bleeding were recorded. **RESULTS:** None of the patients in either control or study group had any serious bleeding complications. **CONCLUSION:** The data suggest that patients can safely undergo routine minor oral surgical procedures without alterations of their therapeutic anticoagulation regime.

REF ID: 3120

Level IV: Non-experimental study

Topic 3: Assessment

Canto, M. T., Drury, T. F., & Horowitz, A. M. (2003). Use of skin and oral cancer examinations in the united states, 1998. *Preventive Medicine*, 37(3), 278-282.

Journal Article, Research, Tables/Charts

BACKGROUND: Findings from previous surveys suggest low utilization of oral cancer examinations, even though this examination is noninvasive. The purpose of this analysis is to compare the use of an oral cancer examination (OCE) and a skin cancer examination (SCE) in the past 12 months within the United States. Both exams are noninvasive and include a visual component. **METHODS:** Weighted data from the Adult Prevention Supplement of the 1998 National Health Interview Survey (NHIS) for adults 40 years of age or older were analyzed using SAS and SUDAAN. A ratio compared the percentage reporting an OCE (%OCE) with the percentage reporting a SCE (%SCE). **RESULTS:** The percentage having an OCE in the past year (13.8%) was very similar to the percentage having a SCE (13.5%) during that same period. With increasing age group, the %OCE/%SCE ratio varied inversely from 1.60 (C.I. 1.42-1.78) among persons 40-49 years to 0.62 (C.I. 0.55-0.69) among persons 70+ years. The ratio was similar in whites and blacks, males and females, and Hispanics and non-Hispanics. There was a positive gradient in the ratio by education and family income.

CONCLUSIONS: Overall, less than 15% of the population is receiving either of these examinations, although the American Cancer Society recommends both of them on an annual basis for individuals 40 years of age and older. To increase detection of these cancers at early stages, extensive educational and media campaigns for the public and providers identifying risk factors and the availability of and the need for these examinations are required. Copyright (C) 2003 by Elsevier Science (USA).

REF ID: 3211

Level V: Literature review

Topic 4: Management

Cassolato, S. F., & Turnbull, R. S. (2003). Xerostomia: Clinical aspects and treatment. *Gerodontology, 20(2)*, 64-77.

Journal Article; Review; D

Xerostomia or dry mouth is a condition that is frequently encountered in dental practice. The most common cause is the use of certain systemic medications, which make the elderly at greater risk because they are usually more medicated. Other causes include high doses of radiation and certain diseases such as Sjogren's syndrome. Xerostomia is associated with difficulties in chewing, swallowing, tasting or speaking. This results in poor diet, malnutrition and decreased social interaction. Xerostomia can cause oral discomfort, especially for denture wearers. Patients are at increased risk of developing dental caries. A thorough intraoral and extra-oral clinical examination is important for diagnosis. Treatment may include the use of salivary substitutes (Biotene), salivary stimulants such as pilocarpine, ongoing dental care, caries prevention, a review of the current prescription drug regimen and possible elimination of drugs having anticholinergic effects. Because of the ageing population, and the concomitant increase in medicated individuals, dentists can expect to be presented with xerostomia in an increasing number of patients in the coming years and therefore should be familiar with its diagnosis and treatment. Therefore, the purpose of this review is to outline for clinicians the common aetiologies, clinical identification, and routine therapeutic modalities available for individuals with xerostomia.

REF ID: 3192

Level I: Systematic review

Topic 6: Comprehensive

Chalmers, J., Johnson, V., Tang, J. H., & Titler, M. G. (2004). Evidence-based protocol: Oral hygiene care for functionally dependent and cognitively impaired older adults. *Journal of Gerontological Nursing, 30(11)*, 5-12.

Journal Article; Review; N

No abstract

REF ID: 3103

Level I: Systematic Review

Topic 6: Comprehensive

Chalmers, J., & Pearson, A. (2005). Oral hygiene care for residents with dementia: A literature review. *Journal of Advanced Nursing, 52(4)*, 410-419.

Journal Article, Research, Systematic Review, Tables/Charts

Aim. This paper presents a literature review of oral hygiene care for adults with dementia in residential aged care facilities, including evidence for: (1) prevalence, incidence, experiences and increments of oral diseases; (2) use of assessment tools to evaluate residents' oral health; (3) preventive oral hygiene care strategies; and (4) provision of dental treatment. Background. The impact of dementia on residential care is ever-increasing and regular oral hygiene care provision is challenging for cognitively impaired residents. Although an abundance of oral hygiene care recommendations for older people have been published, the supporting evidence has not been clearly delineated. Methods. A review was conducted of English language publications (1980-2002), using a two-step approach (keyword electronic database search, supplemented with secondary search of cited references). All 306 selected articles were critically reviewed and systematically categorized. Results. Evidence confirmed clinicians' observations of poor oral health in older residents with dementia. Possible risk factors identified were: salivary dysfunction, polypharmacy, medical conditions, swallowing and dietary problems, functional dependence, oral hygiene care assistance and poor use of dental care. One

comprehensive, reliable and validated oral assessment screening tool for residents with dementia had been published. Expert opinion indicated that oral assessment screening by staff and a dentist would be ideal at admission and regularly thereafter. Clinicians and researchers suggested that oral hygiene care strategies were effective in preventing oral diseases and appropriate for residents with dementia. Conclusion. These literature review findings supported the use of oral assessment screening tools by staff and efficacious preventive oral hygiene care strategies/products for adults with dementia in residential care facilities. Further research with this population is needed to develop and validate oral assessment tools and staff education programmes, trial preventive oral hygiene care strategies/products and trial dementia-focused behaviour management and communication strategies.

REF ID: 3170

Level IV: Non-experimental study

Topic 3: Assessment

Chalmers, J. M., King, P. L., Spencer, A. J., Wright, F. A., & Carter, K. D. (2005). The oral health assessment tool--validity and reliability. *Australian Dental Journal*, 50(3), 191-199.

Journal Article; Validation Studies; D; IM

BACKGROUND: The Oral Health Assessment Tool (OHAT) was a component of the Best Practice Oral Health Model for Australian Residential Care study. The OHAT provided institutional carers with a simple, eight category screening tool to assess residents' oral health, including those with dementia. This analysis presents OHAT reliability and validity results. **METHODS:** A convenience sample of 21 residential care facilities (RCFs) in urban and rural Victoria, NSW and South Australia used the OHAT at baseline, three-months and six-months to assess intra- and inter-carer reliability and concurrent validity. **RESULTS:** Four hundred and fifty five residents completed all study phases. Intra-carer reliability for OHAT categories: percent agreement ranged from 74.4 per cent for oral cleanliness, to 93.9 per cent for dental pain; Kappa statistics were in moderate range (0.51-0.60) for lips, saliva, oral cleanliness, and for all other categories in range of 0.61-0.80 (substantial agreement) ($p < 0.05$). Inter-carer reliability for OHAT categories: percent agreement ranged from 72.6 per cent for oral cleanliness to 92.6 per cent for dental pain; Kappa statistics were in moderate range (0.48-0.60) for lips, tongue, gums, saliva, oral cleanliness, and for all other categories in range of 0.61-0.80 (substantial agreement) ($p < 0.05$). Intraclass correlation coefficients for OHAT total scores were 0.78 for intra-carer and 0.74 for inter-carer reliability. Validity analyses of the OHAT categories and examination findings showed complete agreement for the lips category, with the natural teeth, dentures, and tongue categories having high significant correlations and percent agreements. The gums category had significant moderate correlation and percent agreement. Non-significant and low correlations and percent agreements were evident for the saliva, oral cleanliness and dental pain categories. **CONCLUSION:** The Oral Health Assessment Tool was evaluated as being a reliable and valid screening assessment tool for use in residential care facilities, including those with cognitively impaired residents.

REF ID: 3159

Level I: Systematic Review

Topic 3: Assessment

Chalmers, J. M., & Pearson, A. (2005). A systematic review of oral health assessment by nurses and carers for residents with dementia in residential care facilities. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 25(5), 227-233.

Journal Article; Review; D

This paper presents systematic review findings to best summarize the assessment of oral health and the use of oral assessment tools by nurses and carers for adults with dementia living in residential aged care facilities. The systematic review searched electronic databases for articles in English (1980 to 2002) and supplemented these with a secondary search of references cited in articles meeting the review inclusion criteria. Delineation is needed between a comprehensive dental examination conducted by a qualified dentist and a dental assessment screening by a carer, nurse, allied health professional or medical practitioner. Dental examinations should be supplemented with oral health assessments and screenings by trained nurses and carers to monitor residents' oral health, evaluate oral hygiene care interventions, act as a trigger to call in a dentist when

required, assist with residents' individualized oral hygiene care planning and assist with triaging and prioritization of residents' dental needs. To date, the most comprehensive, validated and reliable assessment screening tool for use by nurses and carers with cognitively impaired institutionalized residents is the Brief Oral Health Status Examination. Other less comprehensive oral assessment tools that are useful for nurses and carers of institutionalized dementia populations include the Index of Activities of Daily Oral Hygiene and the Mucosal Plaque Score. These review findings presented evidence to support the use of oral assessment screening tools by nurses and carers for cognitively impaired residents living in residential aged care facilities. Few validated and reliable tools have been published for use by carers in the cognitively impaired residential care population, and continued evolution of oral assessment screening tools needs to embrace the complete spectrum of residents' levels of cognitive impairment.

REF ID: 3101

Level IV: Non-experimental study

Topic 1: Risks

Chen, C. C., Chang, C., Chyun, D. A., & McCorkle, R. (2005). Dynamics of nutritional health in a community sample of american elders: A multidimensional approach using roy adaptation model. *Advances in Nursing Science*, 28(4), 376-389.

Journal Article, Research, Tables/Charts

Nutritional health of community-dwelling elders has been shown to be one of the prime indices of health, influencing the elders' ability to live independently. However, little research has been directed toward understanding the dynamics of nutritional health in community-dwelling elders using a multidimensional theory approach. The purpose of this study was to evaluate the dynamics of nutritional health within the context of Roy Adaptation Model. Factors associated with nutritional health of community-dwelling elders were cross-examined. Depressive symptoms, functional status, oral health, and income emerged as independent predictors of nutritional health adjusting for confounders. This finding lends support to the notion that multidimensional biopsychosocial factors contribute to the dynamics of nutritional health.

REF ID: 3164

Level V: Case report

Topic 1: Risks

Cheng, A., Mavrokokki, A., Carter, G., Stein, B., Fazzalari, N. L., & Wilson, D. F. et al. (2005). The dental implications of bisphosphonates and bone disease. *Australian Dental Journal*, 50(4 Suppl 2), S4-13.

Case Reports; Journal Article; Review; D; IM

In 2002/2003 a number of patients presented to the South Australian Oral and Maxillofacial Surgery Unit with unusual non-healing extraction wounds of the jaws. All were middle-aged to elderly, medically compromised and on bisphosphonates for bone pathology. Review of the literature showed similar cases being reported in the North American oral and maxillofacial surgery literature. This paper reviews the role of bisphosphonates in the management of bone disease. There were 2.3 million prescriptions for bisphosphonates in Australia in 2003. This group of drugs is very useful in controlling bone pain and preventing pathologic fractures. However, in a small number of patients on bisphosphonates, intractable, painful, non-healing exposed bone occurs following dental extractions or denture irritation. Affected patients are usually, but not always, over 55 years, medically compromised and on the potent nitrogen containing bisphosphonates pamidronate (Aredia/Pamisol), alendronate (Fosamax) and zolendronate (Zometa) for non-osteoporotic bone disease. Currently, there is no simple, effective treatment and the painful exposed bone may persist for years. The main complications are marked weight loss from difficulty in eating and severe jaw and neck infections. Possible preventive and therapeutic strategies are presented although at this time there is no evidence of their effectiveness. Dentists must ask about bisphosphonate usage for bone disease when recording medical histories and take appropriate actions to avoid the development of this debilitating condition in their patients.

REF ID: 3275

Level V: Literature review

Topic 6: Comprehensive

Choo, A., Delac, D. M., & Messer, L. B. (2001). Oral hygiene measures and promotion: Review and

considerations. *Australian Dental Journal*, 46(3), 166-173.

Journal Article; Review; D; IM

Current mechanical and chemotherapeutic approaches to oral hygiene aim to modify the oral microflora to promote healthy periodontal and dental tissues. Current oral hygiene measures, appropriately used and in conjunction with regular professional care, are capable of virtually preventing caries and most periodontal disease and maintaining oral health. Toothbrushing and flossing are most commonly used, although interdental brushes and wooden sticks can offer advantages in periodontally involved dentitions. Chewing sugar-free gums as a salivary stimulant is a promising caries-preventive measure. Despite new products and design modifications, mechanical measures require manual dexterity and cognitive ability. Chemotherapeutic supplementation of mechanical measures using dentifrices, mouthrinses, gels and chewing gums as delivery vehicles can improve oral hygiene. The list includes anticalculus, antibacterial and cariostatic agents. For the population at large to make effective use of these oral hygiene measures, oral hygiene promotion needs to be implemented. Considerations include the role of parents, school and the media for children and the workplace, social environments, nursing homes and trained carers for adults and the elderly. Community oral hygiene promotion must attempt to maximise opportunities for oral health for all and reduce inequalities by removing financial and other barriers. Oral health approaches should be tailored to lifestyles and abilities of children, adults and the elderly in order to enable them to make decisions to improve personal oral hygiene and oral health.

REF ID: 3195

Level V: Literature review

Topic 4.3: Management-medication

Ciancio, S. G. (2004). Medications' impact on oral health. *The Journal of the American Dental Association*, 135(10), 1440-8; quiz 1468-9.

Journal Article; Review; D; IM

BACKGROUND: Over-the-counter and prescription drugs are used frequently, in large quantities and by many adults, particularly by those older than 65 years of age. A number of medications (prescription, over-the-counter, vitamins and minerals, herbal preparations) can affect oral health. With the population's aging, and as more drugs become available, dentists can expect to encounter medication-related oral side effects among their patients. **TYPES OF STUDIES REVIEWED:** The author reviewed studies that ranged from case reports to randomly controlled, double-blinded studies. However, in view of the subject matter, the majority of findings are based on case reports. **CONCLUSIONS:** Since many patients regularly take medications, both prescribed and nonprescribed, dentists always must take a thorough medical history so that they can be aware of medication-related problems and the impact of medications on diagnosis and treatment planning. **CLINICAL IMPLICATIONS:** Dentists must be aware of the potential oral tissue complications that medications can create and develop appropriate treatment plans for their patients that consider the oral health impact of the medications they take.

REF ID: 3132

Level IV: Non-experimental study

Topic 1: Risks

CohenMansfield, J., & Lipson, S. (2002). The underdetection of pain of dental etiology in persons with dementia. *American Journal of Alzheimer's Disease and Other Dementias*, 17(4), 249-253.

Journal Article, Research

BACKGROUND: The detection of dental pain in persons suffering from dementia has not yet been investigated. **SUBJECTS AND METHODS:** Twenty-one nursing home residents with a mean age of 88 participated in this study. Nine rotating volunteer dentists came to the nursing home to conduct dental evaluations. Two outside geriatricians performed a second assessment, and additional information concerning dental status was obtained from the minimum data set (MDS). **RESULTS:** Over 60 percent of assessed participants were considered to have a pain-causing condition. Less than half of these were rated by the geriatricians as having dental related pain. Only one participant was rated to have dental or mouth pain on the MDS. Only one of the 18 persons with either a full or partial evaluation had no dental problems. **CONCLUSIONS:** Dental problems are underdetected and undertreated in the nursing home. Better training

for non-dentists in detection of such problems and better reimbursement for dental care are needed to improve care of residents.

REF ID: 3255

Level V: Literature review

Topic 4: Management

Coleman, P. (2002). Improving oral health care for the frail elderly: A review of widespread problems and best practices. *Geriatric Nursing (New York, N.Y.)*, 23(4), 189-199.

Journal Article; Review; N

Oral health is an important component of overall health, well-being, and quality of life for institutionalized elders. Despite reports by nurses of the importance of oral hygiene, empirical evidence shows that daily oral care interventions have not been effective in safeguarding the oral and general health of this vulnerable population. Effective practice must involve not only recognizing its importance but also ensuring that daily oral hygiene receives the same priority as other care practices.

REF ID: 3163

Level III: Quasi-experimental study

Topic 4: Management

Coleman, P., & Watson, N. M. (2006). Oral care provided by certified nursing assistants in nursing homes. *Journal of the American Geriatrics Society*, 54(1), 138-143.

Journal Article; Multicenter Study; IM

The purpose of this study was to describe the actual daily oral care provided by certified nursing assistants (CNAs) for dentate elderly nursing home (NH) residents who required assistance with oral care. The study was conducted in five nonrandomly selected NHs in upstate New York using real-time observations of CNAs providing morning care to residents, retrospective chart review, and CNA screening interviews. Oral care standards developed and validated by a panel of 10 experts (dentists, dental hygienists, registered nurses) to be appropriate for dentate NH residents were used to evaluate the oral care provided by 47 primary dayshift CNAs to a convenience sample of 67 residents. CNAs were blinded to the study's specific focus on oral care. Adherence to individual standards was low, ranging from a high of 16% to a low of 0%. Teeth were brushed and mouths rinsed with water in 16% of resident observations. One resident had her tongue brushed. Standards never met were brushing teeth at least 2 minutes, flossing, oral assessment, rinsing with mouthwash, and wearing clean gloves during oral care. Most residents (63%) who received oral care assistance were resistive to CNA approaches. For most observations, oral care supplies were not evident. Actual oral care provided to residents contrasts sharply with CNAs' self-reported practices in the literature and suggests that NH residents who need assistance receive inadequate oral health care.

REF ID: 3135

Level V: Program Evaluation

Topic 4: Management

Connell, B. R., McConnell, E. S., & Francis, T. G. (2002). Tailoring the environment of oral health care to the needs and abilities of nursing home residents with dementia. *Alzheimer's Care Quarterly*, 3(1), 19-25.

Journal Article, Research, Tables/Charts

This study developed and tested an intervention to promote use of preserved abilities in oral care among nursing home (NH) residents with dementia. Changes were made to environmental support for oral care and in how nursing staff provided oral care. Five NH residents participated. Changes in oral care independence and oral hygiene adequacy were assessed. Four (of 5) participants were more independent in key, "in-the-mouth" oral care tasks. Oral hygiene ratings improved 47% (+/-27%). All residents responded positively to the intervention. Although some staff complained initially, most embraced the changes after trying them.

REF ID: 3085

Level IV: Non-experimental study

Topic 1: Risks

Cruz, G. D., Galvis, D. L., Kim, M., LeGeros, R. Z., Barrow, S. L., & Tavares, M. et al. (2001). Self-perceived oral health among three subgroups of asian-americans in new york city: A preliminary study.

Community Dentistry and Oral Epidemiology, 29(2), 99-106.

Journal Article, Research, Tables/Charts

OBJECTIVES: The aim of this preliminary study was to compare the perception of oral health among subgroups of Asian-American residents of New York City, USA. **METHODS:** A close-ended questionnaire was administered to 255 Chinese, 134 Indian and 84 Pakistani adults, aged 18-65 years, during 1994-95. A comprehensive dental and oral examination was also performed. The associations of demographic and oral health variables with perceived oral health were evaluated using multivariate ordinal regression models.

RESULTS: When data were analyzed in a multivariate context, only ethnicity and income were significant predictors of perceived oral health, after adjusting for DMFT. The within-group multivariate analysis of the three ethnic subgroups' results were as follows: Among the Chinese there were no significant predictors, only income was strongly suggestive; among the Indians, number of missing teeth and number of years in the USA were significant predictors; and within the Pakistani group, DMFT was the only significant predictor.

CONCLUSIONS: Results suggest that there are ethnic differences in the perception of oral health status even after adjusting for clinical variables as well as for demographic variables in this particular group of Asian-American residents of New York City. Predictors associated with the perception of oral health are different for each ethnic group. When designing oral health promotion activities to diverse ethnic groups, the cultural characteristics of each subgroup should be considered.

REF ID: 3202

Level V: Case report

Topic 1: Risks

Dahlin, C. (2004). Oral complications at the end of life. *The American Journal of Nursing, 104(7), 40-7; quiz 48.*

Case Reports; Journal Article; Review; AIM; IM; N

REF ID: 3248

Level IV: Non-experimental study

Topic 3: Assessment

Danhauer, S. C., Miller, C. S., Rhodus, N. L., & Carlson, C. R. (2002). Impact of criteria-based diagnosis of burning mouth syndrome on treatment outcome. *Journal of Orofacial Pain, 16(4), 305-311.*

Clinical Trial; Journal Article; D

AIMS: Burning mouth syndrome (BMS) primarily affects postmenopausal women and is often difficult to treat successfully. Treatment outcomes have been problematic because of failure to distinguish between patients with BMS and patients presenting with oral burning (OB) resulting from other clinical abnormalities. The purpose of this study was to determine characteristics that might uniquely identify BMS patients from patients with OB and to determine whether proper classification influences treatment outcome. **METHODS:** The clinical sample consisted of 69 patients (83% female) with an average age of 62 years, pain duration of 2.45 years, and visual analog scale pain rating of 49 mm (rated from 0 to 100 mm). All patients underwent a clinical exam and completed the Multidimensional Pain Inventory and Symptom Checklist 90-Revised.

RESULTS: There were no differences between the BMS and OB groups with respect to age, pain duration, pain intensity, life interference, and levels of psychologic distress. Patients with OB demonstrated more clinical abnormalities than BMS patients. Hyposalivation and greater use of prescription medications, most notably hormone replacement therapy, were more common in the OB group compared with the BMS group. When treatment was provided that corrected an identifiable abnormality, significantly more OB than BMS patients reported greater than 50% relief from baseline pain rating. **CONCLUSION:** These data indicate that while BMS and OB groups may initially present with similar clinical and psychosocial features, they are distinguishable with careful diagnosis that often enables successful management of symptoms for each group.

REF ID: 3216

Level I: Systematic review

Topic 4.4: Management-products

Davies, R. M. (2004). The rational use of oral care products in the elderly. *Clinical Oral Investigations, 8(1), 2-5.*

Journal Article; Review; D

This review examines the evidence of the effectiveness of oral care products in preventing and controlling dental caries and periodontal disease in the ageing population. The strength of evidence is indicated using the following hierarchy: Type 1 (systematic reviews), Type 2 (randomised controlled trials), Type 3 (observational studies) and Type 4 (traditional reviews). Most of the evidence to support the effectiveness of fluoride products is extrapolated from studies involving children and adolescents. The few studies that have been performed in older adults suggest that fluoride toothpaste and, in the case of high caries risk individuals, the adjunctive use of other fluoride delivery systems, may be effective in preventing coronal and root caries. Some dentifrices containing triclosan have been shown to improve plaque control and gingival health and one, which contains triclosan/copolymer, reduces the progression of periodontitis in adults and high-risk individuals. Powered toothbrushes with an oscillation-rotation action are more effective in reducing plaque and improving gingival health than manual toothbrushes.

REF ID: 3225

Level V: Literature review

Topic 4: Management

DeBiase, C. B., & Austin, S. L. (2003). Oral health and older adults. *Journal of Dental Hygiene : JDH / American Dental Hygienists' Association*, 77(2), 125-45; quiz 145-8.

Journal Article; Review; D

The population of individuals aged 65 and older is growing dramatically and is expected to increase 126% by 2011, compared to only a 42% rise in the population of the United States as a whole. The fastest growing segment of the older adult population is persons aged 85 and older (Figure 1). Although many members of this generation lead healthy independent lives, the challenge faced by oral health care professionals is providing care to the chronically ill and/or homebound or institutionalized older adult, particularly the oldest old and those with limited finances. Effective communication skills are essential when dealing with older adults and their families. Collaboration between medical/allied health professionals and oral health care professionals is also critical in order to accurately assess and manage the oral health needs of the aging patient. A preventive approach to oral health with sensitivity to the physical, mental, and social status of the patient is the focus of this course. Marketing strategies to alleviate common barriers to seeking oral health care among this age group are provided.

REF ID: 3128

Level IV: Non-experimental study

Topic 1: Risks

Dennesen, P., van der Ven, A., Vlasveld, M., Lokker, L., Ramsay, G., & Kessels, A. et al. (2003). Inadequate salivary flow and poor oral mucosal status in intubated intensive care unit patients. *Critical Care Medicine*, 31(3), 781-786.

Journal Article, Research, Tables/Charts

OBJECTIVE: To investigate salivary flow and frequency of oral mucositis in intensive care unit patients compared with patients admitted because of elective coronary artery bypass graft (CABG) surgery. In addition, the pattern of oropharyngeal colonization was investigated in these patients. **DESIGN:** Prospective study. **SETTING:** Mixed intensive care unit and cardiothoracic ward. **PATIENTS:** In this study, 24 ventilated intensive care unit patients and 20 CABG patients were included. **MEASUREMENTS AND MAIN RESULTS:** Two dental hygienists examined intensive care unit patients for the presence of periodontal disease and mucositis at admission and subsequently every week during their stay in the intensive care unit. At the same time, stimulated salivary flow and salivary total immunoglobulin A output were measured. Oropharyngeal cultures were obtained as well. CABG patients were examined the day before the operation, 1 day, 1 wk, and 2 wks after the operation. The following results were obtained: a) temporarily reduced postoperative stimulated salivary flow and total salivary immunoglobulin A output in CABG patients and nearly absent stimulated salivary flow in intensive care unit patients; b) oropharyngeal colonization with potentially pathogenic microorganisms in intensive care unit and not in CABG patients; and c) the increase in mucositis index in intensive care unit patients paralleled the increase in potentially pathogenic microorganism oropharyngeal colonization, especially and. **CONCLUSIONS:** Absence of adequate salivary flow in intubated

intensive care unit patients causes severe xerostomia, which may contribute to the development of mucositis and oropharyngeal colonization with Gram-negative bacteria.

REF ID: 3166

Level V: Literature review

Topic 4: Management

Department of Health, United Kingdom. (2005). Meeting the challenges of oral health for older people: A strategic review. *Gerodontology*, 22 Suppl 1, 3-48.

Guideline; Journal Article; D

REF ID: 3113

Level IV: Non-experimental study

Topic 1: Risks

Desvarieux, M., Schwahn, C., Volzke, H., Demmer, R. T., Ludemann, J., & Kessler, C. et al. (2004). Gender differences in the relationship between periodontal disease, tooth loss, and atherosclerosis. *Stroke*, 35(9), 2029-2035.

Journal Article, Research, Tables/Charts

Background and Purpose--Males carry a disproportionate burden of cardiovascular disease. Because males also bear a higher burden of periodontal disease, we investigated the existence of gender differences in the postulated relationship between periodontal infections, tooth loss, and subclinical atherosclerosis. Methods--A total of 1710 randomly enrolled participants between the ages of 45 and 75 with no history of myocardial infarction or stroke received a clinical periodontal examination, carotid scan using high-resolution B-mode ultrasound, and extensive measurements for conventional cardiovascular risk factors (age, education, smoking, alcohol, body mass index, diabetes, systolic blood pressure, low-density lipoprotein-cholesterol, high-density lipoprotein-cholesterol, and triglycerides) as well as markers of healthy lifestyle and social network. Results--In both genders, measures of current and long-term periodontitis worsened as tooth loss increased. In males but not females, a 10% difference in carotid artery plaque prevalence was observed between the lowest and highest tertiles of tooth loss ($P < 0.05$) and long-term periodontitis ($P = 0.05$) after multivariate adjustment. Similar patterns were observed for intima-media thickness. The influence of gender on carotid artery plaque prevalence was most evident among the younger age group (< 59 years). Between genders, carotid plaque prevalence differed by 10%, 15%, and 25% across increasing levels of tooth loss, and by 5%, 15%, and 25% across increasing levels of long-term periodontitis. Conclusions--Our data suggest that tooth loss and long-term periodontitis are related to subclinical atherosclerosis in men but not women. Gender variations in cardiovascular morbidity or mortality may be explained partly by the differential contributions of novel risk factors across genders.

REF ID: 3142

Level IV: Non-experimental study

Topic 3: Assessment

Dickinson, H., Watkins, C., & Leathley, M. (2001). The development of the THROAT: The holistic and reliable oral assessment tool. *Clinical Effectiveness in Nursing*, 5(3), 104-110.

Journal Article, Forms, Research, Tables/Charts

REF ID: 3054

Level IV: Non-experimental study

Topic 3: Assessment

Dietrich, T., Stosch, U., Dietrich, D., Schamberger, D., Bernimoulin, J., & Joshipura, K. (2005). The accuracy of individual self-reported items to determine periodontal disease history. *European Journal of Oral Sciences*, 113(2), 135-140.

Journal Article, Research, Tables/Charts

REF ID: 3065

Level IV: Non-experimental study

Topic 1: Risks

Dye Selwitz, R. (2005). The relationship between selected measures of periodontal status and demographic and behavioural risk factors. *Journal of Clinical Periodontology*, 32(7), 798-808.

Journal Article, Research, Tables/Charts

OBJECTIVE: To assess differences between selected periodontal measures by demographic and behavioural factors in a nationally representative sample of the United States. **METHODS:** Data for 11,347 person's ages 20-79 years from the third National Health and Nutrition Examination Survey (NHANES III) were used. Indices and measures constructed from NHANES III data used for this study were: derived community periodontal index (dCPI), attachment loss extent index (ALEI), attachment loss (AL) scores, and a Periodontal Status Measure (PSM) developed for this study. **RESULTS:** The influence of demographic and behavioural factors varied across the four indices examined in multivariate cumulative logistic models. Moreover, there was significant effect modification by cigarette smoking with age in the ALEI and AL models. The odds ratio (OR) of increasing periodontal disease status among 20-39 year olds as measured by AL or ALEI for current smokers compared with non-smokers were OR=6.2 (95% confidence interval (CI)=4.1, 8.7) and OR=5.6 (95% CI=3.7, 8.7), respectively. In a similar comparison, the OR for dCPI was 2.6 (95% CI=1.7, 3.8). Furthermore, Mexican American ethnicity was generally not significant in any models using dCPI, PSM, AL, or ALEI and prior dental visit was more likely to be significant only in the dCPI and PSM models. **DISCUSSION:** Among the well-known demographic and behavioural influences on periodontal health status, some, such as race/ethnicity and prior dental visit status have different relationships with differing periodontal measures employed to assess periodontal status. Moreover, potential interactions among cofactors also are dependent upon the measure selected. Periodontal research findings may be influenced significantly by periodontal measure selection and its affect on measurement validity. This may have particular relevance to issues concerning disease surveillance and assessing reduction of disparities in oral health. Consequently, a renewed approach to developing appropriate measures for periodontal epidemiology is needed.

REF ID: 3187

Level IV: Non-experimental study

Topic 1: Risks

Ekanayke, L., & Perera, I. (2005). Factors associated with perceived oral health status in older individuals. *International Dental Journal*, 55(1), 31-37.

Journal Article; D; IM

AIM: To assess factors associated with perception of oral health in older individuals. **DESIGN:** A cross sectional study. **SETTING:** A densely populated urban area in Sri Lanka. **PARTICIPANTS:** 585 older adults aged 60 years and above of which 475 were living at home and 110 in institutions. The present analysis is limited to 235 subjects who were subjected to a clinical oral examination. **METHOD:** The data were collected by means of an interviewer-administered questionnaire and a clinical oral examination. **RESULTS:** Overall, 48% of the dentate and 42% of the edentate perceived their oral health as poor. The final model of the hierarchical logistic regression analysis for the dentate revealed that presence of retained roots, mobile teeth, >20 missing teeth and perceived need for dental care were significantly associated with poor perceived oral health status. For the edentate, perceived need for dental care, loss of taste sensation and difficulty in eating were significantly associated with poor perceived oral health status. **CONCLUSIONS:** Factors associated with perceived oral health status differed between the dentate and the edentate. Clinical oral health indicators emerged as significant predictors of perceived oral health status in the dentate although the explanatory power of these indicators on perception of oral health was low.

REF ID: 3233

Level V: Literature Review

Topic 1: Risks

Feldman, S. D., An, G., & Halpern, L. R. (2003). Perioperative medical considerations for the geriatric dental patient. risk assessment and management. *Journal of the Massachusetts Dental Society*, 52(1), 14-21.

Journal Article; Review; D

REF ID: 3272

Level IV: Non-experimental study

Topic 1: Risks

Field, E. A., Fear, S., Higham, S. M., Ireland, R. S., Rostron, J., & Willetts, R. M. et al. (2001). Age and

medication are significant risk factors for xerostomia in an English population, attending general dental practice. *Gerodontology*, 18(1), 21-24.

Journal Article; Multicenter Study; D

OBJECTIVE: To study the prevalence of xerostomia in an English population, attending general dental practice and relate it to age, medication and gender. DESIGN STUDY: Cross-sectional. SETTING: Five General Dental Practices in Merseyside, North of England. SUBJECTS: 1,103 adult patients attending for routine dental care. INTERVENTION: Questionnaire administered by dentists. MAIN OUTCOME MEASURES: Age, gender, systemic medication, reported oral dryness. RESULTS: 1,103 patients (654 females) were recruited, of whom 427 (39%) were aged 60 years or older. 26% of patients reported taking medication. The overall prevalence of xerostomia was 12.7% (males--10.3%, females 14.4%). Age, medication and female gender were found to be significant risk factors for xerostomia, using logistic regression analysis. CONCLUSIONS: The prevalence of xerostomia (12.7%) in an English population was lower than reported in previous North American and Swedish studies. Medication was a significant risk factor for xerostomia and a better predictor of risk status, than either age or gender.

REF ID: 3279

Level II: Individual experimental study

Topic 2: Prevention

Frenkel, H., Harvey, I., & Newcombe, R. G. (2001). Improving oral health in institutionalised elderly people by educating caregivers: A randomised controlled trial. *Community Dentistry and Oral Epidemiology*, 29(4), 289-297.

Clinical Trial; Journal Article; Multicenter Study; Randomized Controlled Trial; D; IM

OBJECTIVES: This cluster-randomised controlled trial assessed whether oral health care education (OHCE) for nursing home caregivers would achieve improvements in clients' oral health. METHODS: Twenty-two nursing homes were randomly allocated to intervention or control group. Clients were examined at baseline and at follow-up visits 1- and 6-months after caregivers received OHCE. Main outcome measures were denture plaque, denture-induced stomatitis, dental plaque and gingivitis. Differences in group means/medians were compared with adjustment for cluster randomisation. RESULTS: Clients' baseline oral health was poor. After OHCE, the intervention group's oral health scores improved significantly. Reductions in denture plaque scores (0-4 scale) exceeded those of the control group by 1.15 (95%CI=0.83, 1.47) at 1 month and by 1.47 (95%CI=1.13, 1.80) at 6 months. Denture-induced stomatitis prevalence reduced significantly over 6 months compared to the control group (P<0.0001). Group differences in favour of the intervention group were 0.41 (95%CI=0.18, 0.65) at 1 month and 0.34 (95%CI=0.14, 0.53) at 6 months for dental plaque (0-3 scale), and 0.17 (95%CI= -0.01, 0.35) at 1 month and 0.28 (95%CI 0.15, 0.42) at 6 months for gingivitis (0-2 scale). Key differences remained significant after adjustment for clustering effects. The provider's costs would currently be approximately pounds 6700 per year to deliver the intervention to a Health Authority with 100 homes. CONCLUSIONS: Although final levels of residents' oral health were still short of ideal, this study clearly shows that, for a modest cost, OHCE can improve caregivers' knowledge, attitudes and oral health care performance for elderly, functionally dependent clients.

REF ID: 3236

Level V: Literature review

Topic 1: Risks

Friedlander, A. H., Friedlander, I. K., Gallas, M., & Velasco, E. (2003). Late-life depression: Its oral health significance. *International Dental Journal*, 53(1), 41-50.

Journal Article; Review; D; IM

Late-life depression (LLD) initially occurs after age 65 and is a major public health concern because elderly people who are at high risk constitute an ever-expanding segment of the population. LLD is a mental illness in which mood, thought content, and behavioural patterns are impaired, causing individual distress, compromising social function and impairing self-maintenance skills (e.g. bathing, dressing, hygiene). It is characterised by marked sadness, or a loss of interest or pleasure in daily activities and may be accompanied by weight change, sleep disturbance, fatigue, difficulty concentrating, and high suicide rate. Individuals under treatment for LLD and those whose illness has not been diagnosed or treated often present to the dentist with

significant oral disease. LLD is frequently associated with a disinterest in performing oral hygiene, a cariogenic diet, diminished salivary flow, rampant dental decay, advanced periodontal disease, and oral dysesthesias. Many medications used to treat the disease magnify the xerostomia and increase the incidence of dental disease. Appropriate dental management necessitates a vigorous preventive dental education programme, the use of artificial salivary products, antiseptic mouthwash, daily fluoride mouthrinse and special precautions when administering local anaesthetics with vasoconstrictors and prescribing analgesics.

REF ID: 3158

Level V: Literature review

Topic 4: Management

Friedlander, A. H., & Norman, D. C. (2006). Geriatric alcoholism: Pathophysiology and dental implications. *The Journal of the American Dental Association*, 137(3), 330-338.

Journal Article; Review; D; IM

BACKGROUND: The authors reviewed the clinical features, epidemiology, diagnosis, medical treatment, orofacial findings and dental treatment of geriatric patients with alcoholism. **TYPES OF STUDIES REVIEWED:** The authors conducted MEDLINE searches for the period 1995 through 2004 using the terms "alcoholism," "geriatric," "pathophysiology," "treatment" and "dentistry." They selected reports published in English in peer-reviewed journals for further review. **RESULTS:** Physiological changes associated with aging permit the harmful effects of drinking alcohol to arise at lower levels of consumption than in younger people. Excessive use of alcohol exacerbates the medical and emotional problems associated with aging and predisposes the person to adverse drug reactions with medications controlling these illnesses. **CLINICAL IMPLICATIONS:** The incidence of dental disease in this population is extensive because of diminished salivary flow and a disinterest in performing appropriate oral hygiene techniques. Concurrent abuse of tobacco products worsens dental disease and heightens the risk of developing oral cancer. Identification of patients who abuse alcohol, a cancer-screening examination, preventive dental education, and use of saliva substitutes and anticaries agents are indicated. Clinicians must take precautions when performing surgery and when prescribing or administering analgesics, antibiotics or sedative agents that are likely to have an adverse interaction with alcohol.

REF ID: 3253

Level V: Literature review

Topic 1: Risks

Friedlander, A. H., & Norman, D. C. (2002). Late-life depression: Psychopathology, medical interventions, and dental implications. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*, 94(4), 404-412.

Journal Article; Review; D; IM

BACKGROUND: Late-life depression (LLD) initially occurs after age 65 years and is a major public health concern because the elderly who are at high risk constitute an ever-expanding segment of the population. LLD is a mental illness in which mood, thought content, and behavioral patterns are impaired, causing the individual distress, compromising social function, and impairing self-maintenance skills (eg, bathing, dressing, hygiene). LLD characterized by marked sadness or a loss of interest or pleasure in daily activities and may be accompanied by weight change, sleep disturbance, fatigue, difficulty in concentration, and a high suicide rate. Diagnosis of LLD is sometimes complicated by a denial of mood change and an inability to distinguish symptoms of a concurrent physical illness from those of a depressive etiology. The disorder is most frequently treated with antidepressant medications, and although older individuals have a recovery rate that is comparable with younger adults, they often take longer to recover, have more frequent relapses, and are more sensitive to the side effects of the drugs. **CLINICAL IMPLICATIONS:** Individuals undergoing treatment for LLD and those whose illness has not been diagnosed or treated often are seen with significant oral disease by the dentist. Dentists need to be cognizant of how to safely and compassionately provide care to those already receiving mental health services. They must also be familiar with the psychiatric symptoms of the disorder to effectuate a timely referral to a physician of those with occult or relapsing disease. LLD is frequently associated with a disinterest in oral hygiene, a cariogenic diet, diminished salivary flow, rampant dental decay, advanced periodontal disease, and oral dysesthesias. Many medications used to treat the disease

magnify the xerostomia and increase the incidence of dental disease. Appropriate dental management necessitates a vigorous preventive dental education program, the use of artificial salivary products, antiseptic mouthwash, daily fluoride mouth rinse, and special precautions in administration of local anesthetics with vasoconstrictors and prescription of analgesics. **CONCLUSION:** Dentists who invoke appropriate precautions can usually provide a full range of services to individuals with LLD, thereby enhancing patient self-esteem and contributing to the psychotherapeutic aspect of management.

REF ID: 3165

Level II: Individual experimental study

Topic 2: Prevention

Frost, P. M., Shirlaw, P. J., Challacombe, S. J., Fernandes-Naglik, L., Walter, J. D., & Ide, M. (2006). Impact of wearing an intra-oral lubricating device on oral health in dry mouth patients. *Oral Diseases*, 12(1), 57-62.

Clinical Trial; Journal Article; Randomized Controlled Trial; D

OBJECTIVE: To establish whether an intra-oral lubricating device for dry mouth alters the oral environment. **DESIGN:** A single-blind randomized cross-over study. **METHOD:** Twenty-nine dentate subjects from the Sjogren's syndrome clinic attended on five occasions at 4-week intervals. They were randomized, having the device fitted on either the second or the fourth visit for the experimental period, whilst using their preferred method of lubrication throughout the rest of the study. The preferred methods of lubrication were either water (group 1, n = 10) or saliva substitute (group 2, n = 9) or sugar-free chewing gum (group 3, n = 10). At each visit microbiological, unstimulated and stimulated saliva samples were collected. Dry mouth score, speech test and periodontal indices were recorded. **RESULTS:** The water lubrication group (1) had a resting salivary flow greater than lubrication groups (2 and 3) by post-ANOVA contrasts ($P < 0.001$). The postdevice data also demonstrated a salivary flow greater than lubrication group (3) by post-ANOVA contrasts ($P < 0.05$). The epithelial cell count using the Spearman correlation was high, possibly reflecting increased viscosity of the saliva ($P = 0.044$). The speech test indicated that the experimental subjects had difficulty in speaking ($P = 0.001$). This was slightly easier postdevice wear. Streptococcus mutans ($P = 0.009$) and Lactobacillus ($P = 0.058$) increased in the saliva after wearing the device. Salivary flow rate, Candida albicans, oral dryness, speaking and periodontal indices were unchanged. **CONCLUSIONS:** The oral environment was altered by wearing a lubricating device with an increase in the numbers of Strep. mutans and Lactobacillus. Clinical dryness and speech test correlated with the mean whole salivary flow suggesting a screening method for xerostomia.

REF ID: 3060

Level V: Unknown, but labelled Research

Topic 4: Management

Georg, D. (2006). Improving the oral health of older adults with dementia/cognitive impairment living in a residential aged care facility. *International Journal of Evidence-Based Healthcare*, 4(1), 54-61.

Journal Article, Research, Tables/Charts

REF ID: 3114

Level IV: Non-experimental study

Topic 3: Assessment

Gilbert, G. H., Meng, X., Duncan, R. P., & Shelton, B. J. (2004). Incidence of tooth loss and prosthodontic dental care: Effect on chewing difficulty onset, a component of oral health-related quality of life. *Journal of the American Geriatrics Society*, 52(6), 880-885.

Journal Article, Research, Tables/Charts

OBJECTIVES: To quantify incidence of tooth loss, prosthodontic dental restoration, and chewing difficulty onset and the effect of tooth loss and prosthodontic restoration on chewing difficulty onset. **DESIGN:** A prospective cohort study of oral health and related behaviors with in-person interviews and clinical examinations conducted at baseline and 24 months. Telephone interviews were conducted every 6 months between these sessions. **SETTING:** A community-based sample of four counties in north Florida. **PARTICIPANTS:** Eight hundred seventy-three persons who had at least one tooth and were aged 45 and older at baseline. **MEASUREMENTS:** Persons were queried regarding onset of chewing difficulty, an important

component of oral health-related quality of life (OHRQoL). The chewing index of Leake, with minor revision, was the primary outcome of interest. Tooth loss was measured using direct clinical examination. Dental care use was reported during each interview. RESULTS: Approximately 22% of participants reported tooth loss during follow-up. Fixed prosthodontics (crowns and bridges) was the most common form of new prosthodontic treatment. People who reported tooth loss were 2.7 times more likely to report chewing difficulty onset than people without tooth loss ($P < .001$). Having fewer occluding pairs of teeth at baseline was significantly associated with an increased probability of chewing difficulty onset. People who received removable prosthodontic treatment were much less likely to report chewing difficulty onset than people who did not ($P < .01$). CONCLUSION: Incident tooth loss and removable prosthodontic restoration strongly predicted chewing difficulty, an important component of OHRQoL.

REF ID: 3058

OM: Quality Measures

Topic 4: Management

GilMontoya, J. A., Ferriera de Mello, A. L., Cardenas, C. B., & Lopez, I. G. (2006). Oral health protocol for the dependent institutionalized elderly. *Geriatric Nursing*, 27(2), 95-102.

Journal Article, CEU, Exam Questions, Forms, Research, Tables/Charts

Establishing an oral hygiene protocol for the frail and functionally dependent elderly should be of special concern to health care providers. The previous assessment of a care center, including patients or residents and staff, allows an effective strategy to be designed. Oral health protocols are mainly based on the daily removal of bacterial plaque from teeth or prostheses (or both), cleaning of oral mucosa, and continual oral hydration. These practices are facilitated by the use of electric toothbrushes and products such as chlorhexidine, fluoride toothpastes, and rinses or gels for dry mouth. This type of protocol should include regular collaboration with dental professionals and provide a program of continuous training for nursing staff on oral health issues.

REF ID: 3230

Level VI: Opinion

Topic 1: Risks

Gilmour, A. G., & Morgan, C. L. (2003). Restorative management of the elderly patient. *Primary Dental Care : Journal of the Faculty of General Dental Practitioners (UK)*, 10(2), 45-48.

Journal Article; D

It is predicted that geriatric patients will dramatically increase in number within our working lives. Although they are considered to demand treatment less frequently than the younger age groups, there are specific issues that need to be considered when providing dental treatment for these patients. The term gerodontology has been coined to describe this subject. The need to consider family relationships and the role of carers may play a greater part in their dental management than that of the general population. As well as oral disease, the incidence of general disease is higher in this population, as is the amount of medication prescribed to treat it; these factors often complicate dental management. Special problems that will have a high dental impact on the geriatric patient may be lack of adaptive potential, poor plaque control, root caries, periodontal breakdown and levels of toothwear.

REF ID: 3259

Level V: Literature review

Topic 1: Risks

Gitto, C. A., Moroni, M. J., Terezhalmay, G. T., & Sandu, S. (2001). The patient with Alzheimer's disease. *Quintessence International*, 32(3), 221-231.

Journal Article; Review; D

Victims of Alzheimer's disease show a gradual and steady deterioration in memory, orientation, emotional stability, language capacity, abstract thinking, motor skills, and, ultimately, self care. Cognitive and motor deficits are accompanied by a gradual inability to perform adequate oral hygiene. Alzheimer's disease also interferes with the patient's ability to communicate dental symptoms of pain or dysfunction, and progressive deterioration of cognition interferes with the patient's ability to tolerate most therapeutic interventions. When treating patient's with Alzheimer's disease, oral health care providers must develop timely, preventive, and therapeutic strategies compatible with the patient's physical and cognitive ability to undergo and respond to

dental care. They should strive to achieve those goals with the same ethical, moral, and professional standards of care as may be appropriate in the management of any other patient.

REF ID: 3267

Level V: Literature review

Topic 1: Risks

Glick, M. (2002). Screening for traditional risk factors for cardiovascular disease: A review for oral health care providers. *The Journal of the American Dental Association*, 133(3), 291-300.

Journal Article; Review; D; IM

BACKGROUND: Cardiovascular disease, or CVD, is associated with a very high rate of morbidity and mortality among people in the United States. Primary and secondary prevention measures will help reduce cardiovascular events and increase the overall health of the patient population. **METHODS:** The author conducted MEDLINE and Internet searches and reviewed publications from professional organizations for the most up-to-date information on CVD and associated risk factors. **RESULTS:** More than 450,000 articles and monographs on CVD were published in English between January 1990 and May 2001. Of these, approximately 45,000 discussed CVD and risk factors. The author selected and reviewed more than 550 publications on the basis of their relevance to epidemiology, etiology, and primary and secondary prevention of CVD. **CONCLUSIONS:** Recent information regarding the pathogenesis and treatment of CVD suggests that oral health care providers can perform screening for risk factors and aid in monitoring of specific conditions that put people at an increased risk of developing and exacerbating existing CVD. Dentists need to take a proactive role in this endeavor. **CLINICAL IMPLICATIONS:** As with most medical conditions, oral health care providers play an important function as it relates to the overall health of their patients. This article provides a timely update on CVD and the relationship between CVD and its risk factors, and offers suggestions for oral health care providers as to when they should interact with patients and patients' primary health care providers to possibly reduce the mortality and morbidity of CVD.

REF ID: 3273

Level IV: Non-experimental study

Topic 3: Assessment

Goodis, H. E., Rossall, J. C., & Kahn, A. J. (2001). Endodontic status in older U.S. adults. report of a survey. *The Journal of the American Dental Association*, 132(11), 1525-30; quiz 1595-6.

Journal Article; D; IM

BACKGROUND: Aging people experience a number of changes in the root canal systems of teeth that, while they are normal, have the potential to compromise the pulp's response to injury. **METHODS:** To better understand the dental perspective on these changes, the authors mailed a questionnaire to diplomates of the American Board of Endodontics. The questions dealt with the respondents' experiences, ages of their patient population and their perception of root canal changes in aging patients. The authors analyzed the data in terms of number of diplomates providing a response and stratified them on the basis of the respondents' number of years in practice. **RESULTS:** Respondents indicated that the number of patients aged 65 years and older in their practices is increasing. Virtually all of the diplomates agreed that the root canal gets smaller with age, but that this diminution does not contribute to the failure of treatment of affected teeth. Most respondents indicated that aging patients' teeth are in poorer condition than those of younger patients. **CONCLUSIONS:** As the U.S. population ages, clinicians need to have a better understanding of the physiological changes occurring in older patients' teeth that may influence the treatment required to help patients retain their natural dentition. Further studies are needed to determine the impact of aging on dental disease and treatment modalities. **CLINICAL IMPLICATIONS:** Recognition of changes in the dentition of aging patients will lead to more successful treatment, retention of functional natural dentition and better maintenance of general health.

REF ID: 3271

Level II: Individual experimental study

Topic 4.4: Management-Products

Gornitsky, M., Paradis, I., Landaverde, G., Malo, A. M., & Velly, A. M. (2002). A clinical and microbiological evaluation of denture cleansers for geriatric patients in long-term care institutions.

Clinical Trial; Journal Article; Randomized Controlled Trial; D; IM

Background: Many elderly patients in long-term care hospitals cannot adequately brush their dentures because of disease, dementia and poor dexterity. Such inadequate cleaning may allow for the multiplication of *Candida* spp. and bacteria, which could serve as reservoirs for disseminating infections. Objective: To assess the efficacy of 3 denture cleansers in reducing the number of microorganisms on dentures in a hospitalized geriatric population. Methods: Three brands of cleanser (Denture Brite, Polident and Efferdent) were compared; water was used as the control. Microbiological samples were obtained before and after 3 one-week periods of cleanser use; these samples were taken by a microbiologist blinded to the assigned treatment. In the statistical analysis, the ranks of the differences between the before-treatment and after-treatment scores of each regimen were compared by means of the general linear model. In addition, the efficacy of each cleanser in reducing accumulation of plaque, stain and food was assessed. Results: The rank of the differences in the number of colony-forming units (CFUs) of *Candida* spp. before and after one week of use of Denture Brite ($p = 0.04$) and Polident ($p = 0.01$), was significantly greater than that of the control group, but there was no difference between Efferdent use and control ($p = 0.10$). No significant differences in reduction of *Streptococcus mutans* were observed between Denture Brite ($p = 0.13$) or Polident ($p = 0.12$) and the control group, whereas dentures cleaned with Efferdent exhibited significantly greater reduction in *Streptococcus mutans* ($p = 0.02$) than dentures cleaned with water. Over all study periods, there were no significant differences among the cleansers in reduction of *Candida* spp. or *Streptococcus mutans*. Dentures cleaned with Denture Brite, Polident or Efferdent appeared to have similar reductions in the level of plaque, stain and food, and all had substantially greater reductions than dentures cleaned with water only. The significant difference in the rank of the reduction in *Candida* spp. CFUs ($p = 0.005$) was related to the variance between study periods ($p = 0.01$) and the variance between subjects ($p = 0.008$). Clinical Significance: The use of denture cleansers significantly reduced the number of microorganisms on dentures in a hospitalized geriatric population.

REF ID: 3105

Level III: Quasi-experimental study

Topic 2: Prevention

Grimoud, A. M., Lodter, J. P., Marty, N., Andrieu, S., Bocquet, H., & Linas, M. D. et al. (2005). Improved oral hygiene and candida species colonization level in geriatric patients. *Oral Diseases, 11(3), 163-169.*

Journal Article, Research, Tables/Charts

OBJECTIVES: This work consists in improving oral hygiene (OH) for elderly dependent people in long-term hospital care, in order to decrease the degree of colonization and the associated risk of developing oral candidiasis. As this population frequently suffers from such colonization and because it is difficult to install and practice OH care, a study protocol was designed at the request of geriatricians. The objective of the present study was to set up a programme of OH, applied by the care staff, and to monitor oral colonization of by *Candida* spp. BASIC RESEARCH DESIGN: We compared the levels of hygiene and *Candida* spp. colonization for a group of 110 long-term patients in geriatric departments at T1, when clinical data were collected and oral mycological samples taken before the OH protocol was applied, and at T2, during the postprotocol phase after 3 months of application, when the clinical data and sample collection were repeated. RESULTS: During these 3 months 11 patients died. These patients were excluded from the results, which are presented for matched series of the 99 patients still present at T2. Statistical analysis comparing the clinical and biological parameters at T1 and T2 established that there had been an improvement in OH: the 'adequate' level was reached for 72.4% of patients at T2 compared with 41.8% at T1 (P 50 colony forming units) from 41.9% at T1 to 24.9% at T2 ($P < 0.05$) and from 56.4% at T1 to 13.0% at T2 ($P < 0.05$) respectively. The number of patients with candidiasis fell significantly from 43.2% at T1 to 10.2% at T2. CONCLUSIONS: The OH protocol led to an overall decrease in *Candida* spp. colonization, a significant reduction in the number of candidiasis and an improvement in the level of oral and denture hygiene but vigilance is still necessary concerning OH care and the initial training of staff in specific care of the mouth.

REF ID: 3228

Level IV: Non-experimental study

Topic 1: Risks

Grimoud, A. M., Marty, N., Bocquet, H., Andrieu, S., Lodter, J. P., & Chabanon, G. (2003).

Colonization of the oral cavity by candida species: Risk factors in long-term geriatric care. *Journal of Oral Science*, 45(1), 51-55.

Journal Article; D; IM

The population of elderly people in hospitals for long-term geriatric care presents many risk factors for nosocomial infection by *Candida* species. The aim of this work was to reduce the risk of *C. albicans* nosocomial infections starting from colonization of the oral cavity. The population of concern was the patients in long-stay geriatrics units; a sample of 110 people was selected by drawing lots. The clinical and biological parameters of each patient included in the study were recorded. The oral cavity was colonized by *Candida* spp in 67% of cases. The distribution of the strains showed that *C. albicans* was the most frequently identified strain, followed by *C. glabrata*; of the 73 patients with at least one strain of *Candida* spp., 47 had a clinically diagnosed candidiasis (64.4%). The wearing of dentures was not statistically linked with the development of oral candidiasis. Detecting which patients have been colonized, identifying the risk factors and applying preventive measures should reduce the probability of elderly people falling into the vicious circle of infection-malnutrition-immune-depression.

REF ID: 3283

QM: Quality Measures

Topic 3: Assessment

Guay, A. H. (2005). The oral health status of nursing home residents: What do we need to know?

***Journal of Dental Education*, 69(9), 1015-1017.**

Journal Article; D; IM

REF ID: 3162

Level IV: Non-experimental study

Topic 1: Risks

Hassel, A. J., Koke, U., Schmitter, M., & Rammelsberg, P. (2006). Factors associated with oral health-related quality of life in institutionalized elderly. *Acta Odontologica Scandinavica*, 64(1), 9-15.

Journal Article; D; IM

OBJECTIVE: The aim of this study was to investigate factors associated with the oral health-related quality of life (OHRQoL) of institutionalized elderly in Germany. **MATERIAL AND METHODS:** One-hundred-and-fifty-eight subjects from old people's homes were selected (mean 82.8 years). OHRQoL was measured using the Oral Health Impact Profile (OHIP). Denture characteristics (kind and age of denture, retention of removable denture, number of teeth in static occlusion) and general issues (age, gender, education level, and general pain status) were assessed. All factors were subjected to bivariate testing for their effects on the OHIP summary score (OHIP-SC) and to multivariate testing in subjects with removable dentures (n = 128); a linear regression model with backward elimination was used, with OHIP-SC as the dependent variable. **RESULTS:** In the context of other studies, a median OHIP-SC of 29 indicated highly impaired OHRQoL. According to the bivariate analysis, retention, age of denture, number of teeth in static occlusion, general pain status, and education all exhibited significant influence on OHIP-SC. In the final linear regression model, general pain status, education level, and retention of denture remained at a statistically significant level. The model explained 34% (R² = 0.34) of the variance of the OHIP-SC. The kind of denture had no significant impact on OHIP-SC. **CONCLUSIONS:** In contrast to other groups, the kind of denture exhibited little impact on OHIP-SC for this highly specific collective. However, there were functional aspects of dentures which seemed to be important. Non-dental factors had a striking effect on OHRQoL.

REF ID: 3181

Level IV: Non-experimental study

Topic 3: Assessment

Hawkins, R. J., & Locker, D. (2005). Non-clinical information obtained by dentists during initial examinations of older adult patients. *Special Care in Dentistry : Official Publication of the American*

Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry, 25(1), 12-18.

Journal Article; D

The authors sent a questionnaire to a random sample of general dentists in Ontario, Canada, to assess the types of non-clinical information (NCI) dentists usually obtain during initial examinations of older patients. From a list of 11 NCI questions, dentists indicated which questions they usually asked during new patient examinations. The adjusted response rate was 34% (n = 672). Respondents most often asked about pain and satisfaction with the appearance of teeth and/or dentures. About half the respondents asked about oral dryness and whether problems with chewing had limited food choices. Respondents were least likely to ask about problems with speaking and avoidance of eating with others because of chewing problems. Traits of those who asked the least common NCI questions typically including continuing education courses in geriatric dentistry, self-perceived competence in treating elderly adults living in institutional settings, exposure to geriatric outreach settings during dental school and greater dentist involvement in patient history taking.

REF ID: 3250

Level V: Literature review

Topic 4.3: Management-medication

Heft, M. W., & Mariotti, A. J. (2002). Geriatric pharmacology. *Dental Clinics of North America, 46(4), 869-85, xii.*

Journal Article; Review; D; IM

With the dramatic demographic change that has resulted in the "graying of the population" has come a compelling interest in the health and health concerns of older adults. The increasing incidence and prevalence of systemic diseases, especially chronic diseases, among older adults, and the concomitant increase in medication use, have provided impetus for the subspecialty of geriatric pharmacology. This article reviews the physiologic changes, nonphysiologic aspects, and pharmacologic changes associated with aging and their implications for dental practice.

REF ID: 3252

Level V: Literature review

Topic 6: Comprehensive

Helgeson, M. J., Smith, B. J., Johnsen, M., & Ebert, C. (2002). Dental considerations for the frail elderly. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry, 22(3 Suppl), 40S-55S.*

Journal Article; Review; D

REF ID: 3194

Level IV: Non-experimental study

Topic 3: Assessment

Henriksen, B. M., Ambjornsen, E., Laake, K., & Axell, T. E. (2004). Oral hygiene and oral symptoms among the elderly in long-term care. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry, 24(5), 254-259.*

Journal Article; D

Dental teams examined 1910 elderly adults living in long-term care settings (1358 institutionalized, 552 homebound) from all 19 counties in Norway to document oral hygiene, oral symptoms and ability to receive dental treatment. The Mucosal-Plaque Score (MPS) was used to assess oral status. The MPS was significantly better in women than in men, in individuals with dentures than in those with any remaining teeth, and in people who were homebound rather than those who lived in institutions. The MPS did not differ between age groups or geographic regions. According to the Treatment Ability Index, nearly a quarter of the sample was able to receive comprehensive dental care. Reports of "any oral symptom" and "eating/chewing problems" decreased with age and were most prevalent for individuals who had dentures. The MPS had only slight impact on oral symptoms, chewing ability and dry mouth (p > 0.05). Dry mouth was found in 16.9% and was most prevalent in individuals with dentures.

REF ID: 3229

Level II: Individual experimental study

Topic 4.4: Management-products

Heydecke, G., Locker, D., Awad, M. A., Lund, J. P., & Feine, J. S. (2003). Oral and general health-related quality of life with conventional and implant dentures. *Community Dentistry and Oral Epidemiology*, 31(3), 161-168.

Clinical Trial; Journal Article; Randomized Controlled Trial; D; IM

Implant overdentures and conventional prostheses have been compared in several trials using a variety of functional and oral health-related quality of life (OHQOL) outcomes. In this paper, we describe the impact of implant overdentures on general and OHQOL in seniors. OBJECTIVES: To compare the oral health-related and general quality of life of seniors (aged 65-75 years) who received either mandibular implant overdentures or conventional dentures. METHODS: Sixty edentulous patients were recruited. Thirty received mandibular overdentures retained by two implants (IOD) and a conventional maxillary denture, the other 30 subjects received new maxillary and mandibular conventional complete dentures (CD). All completed the 20-item version of the Oral Health Impact Profile (OHIP-20) before treatment, then at two and 6 months after delivery of the dentures. The SF-36 general health questionnaire was completed at baseline and 6 months only. RESULTS: Pretreatment and 6-month data from 55 subjects were analyzed. Those who received the IODs had significantly better OHIP-20 total scores at 6 months. Results for IOD subjects were also superior in the functional limitation, physical pain, physical disability and psychological disability subscales. While no significant between group difference was found on the SF-36 health survey, significant pre-post-treatment differences within the IOD group were detected for the role emotional, vitality and the social function scales. CONCLUSIONS: Mandibular overdentures retained by two implants provide elderly patients with better OHQOL. General health-related quality of life improved in the implant group.

REF ID: 3068

Level IV: Non-experimental study

Topic 3: Assessment

Heydecke, G., Tedesco, L. A., Kowalski, C., & Inglehart, M. R. (2004). Complete dentures and oral health-related quality of life -- do coping styles matter? *Community Dentistry and Oral Epidemiology*, 32(4), 297-306.

Journal Article, Research, Tables/Charts

Oral health-related quality of life (OHRQOL) in edentulous patients with complete dentures is often impaired. This paper investigates the effect of different coping styles on OHRQOL. PURPOSE: (a) To assess OHRQOL of edentulous patients with conventional complete dentures, and (b) to investigate if individual differences in these patients' styles of coping with stress affect their OHRQOL. MATERIALS AND METHODS: Data were collected from 249 fully edentulous patients with complete dentures (mean age: 66.0 years) who responded to a mailed survey (adjusted response rate: 48.8%). OHRQOL was measured with the 14-item short form of the oral health impact profile (OHIP). Ratings of coping strategies were obtained using the 28-item Brief COPE, an instrument measuring various styles of coping with stress. Linear regression analyses were used to explore the relationships between coping styles, background variables such as age, gender, income, and age of prosthesis, and the patients' OHRQOL. RESULTS: About 35% of the respondents reported impacts from their oral conditions on their overall OHRQOL (OHIP-14 total score) occasionally, fairly often, or often. Physical pain was even more prevalent, with 53.3% of the respondents reporting pain impacts. The linear regression model ($P < 0.0001$) explained 31.1% of the variation in the OHIP-14 total score. The coping variables instrumental support, behavioral disengagement, substance abuse, denial, and religion were significant negative predictors of OHRQOL. Only emotional support was a significant positive predictor of OHRQOL. CONCLUSION: Wearing conventional complete dentures has a significant impact on OHRQOL. This impact is moderated by the styles a patient uses to cope with stress. Using emotional support has a positive effect on OHRQOL, while other coping styles, namely instrumental support, behavioral disengagement, substance abuse, denial, and religion are significant negative predictors of OHRQOL.

REF ID: 3174

Level II: Individual experimental study

Topic 4.4: Management-products

Heydecke, G., Thomason, J. M., Lund, J. P., & Feine, J. S. (2005). The impact of conventional and implant supported prostheses on social and sexual activities in edentulous adults results from a randomized trial 2 months after treatment. *Journal of Dentistry*, 33(8), 649-657.

Clinical Trial; Journal Article; Randomized Controlled Trial; D; IM

OBJECTIVES: To determine the impact of mandibular two-implant overdentures or conventional complete dentures on leisure and sexual activities. **METHODS:** One hundred and two subjects, aged 35-65 years, received either mandibular overdentures retained by two implants (IOD; n=54) or new mandibular conventional complete dentures (CD; n=48) in a randomized controlled clinical trial. A Social Impact Questionnaire was used to assess the impact on social and sexual activity including avoiding conversation, refusing invitations, avoiding sport and feeling uneasy when kissing and in sexual relationships, and the looseness of the prostheses during such activities. Ratings were recorded on categorical scales at baseline and 2 months after treatment. Oral health related quality of life was measured with the Oral Health Impact Profile (OHIP). Between and within group comparisons were carried out using regression models. The correlation between post-treatment OHIP scores and the leisure and sexual impact items was assessed. **RESULTS:** Two months after delivery of the prosthesis there was significant improvements in the IOD group for looseness when eating, speaking, kissing and yawning. The IOD group reported significantly less post treatment looseness than the CD group for all parameters investigated ($p < 0.0001$). IOD subjects felt less uneasy kissing and less uneasy during sexual activity than CD subjects. Correlations between the two sexual activity items (uneasiness when kissing and during sexual relations) and the OHIP scales were weak. **CONCLUSIONS:** Edentulism has a negative impact on social and sexual life. Mandibular overdentures provide greater improvement in of unease in intimate activities than new conventional mandibular dentures.

REF ID: 3199

Level IV: Non-experimental study

Topic 3: Assessment

Ikebe, K., Watkins, C. A., Ettinger, R. L., Sajima, H., & Nokubi, T. (2004). Application of short-form oral health impact profile on elderly japanese. *Gerodontology*, 21(3), 167-176.

Evaluation Studies; Journal Article; D

OBJECTIVES: The purpose of this study was to use the oral health impact profile (OHIP-14) to evaluate the impact of oral disease on the quality of life of a group of independently-living elderly persons in an urban area of Japan. **SUBJECTS:** A total of 1244 participants of the Senior Citizen's College, who attended the lectures once a week. They were community-dwelling, independently-living people over 60 years of age. **MEASUREMENTS:** Japanese version of the short-form OHIP-14. **RESULTS:** Internal reliability for the 14 items overall was very high (Cronbach's alpha = 0.95). Report of 'painful aching' and 'uncomfortable to eat' were the two most highly scored items using the mean sum OHIP-14 score. A multiple logistic regression analysis indicated that the sum OHIP-14 score had significant associations with self-assessment of general health, dental status, and a perceived need for dental treatment. However, age, gender, dissatisfaction with financial status or education level was not significantly associated with the sum OHIP-14. Compared with that of other countries, the items were ranked similarly, whereas the perceived magnitudes of the problems were quite different from other population. **CONCLUSIONS:** The OHIP-14 in Japanese had a high internal reliability, was significantly associated with dental status and comparable ranking for items when compared with studies from other countries.

REF ID: 3244

Level IV: Non-experimental study

Topic 1: Risks

Imсанд, M., Janssens, J. P., Auckenthaler, R., Mojon, P., & Budtz-Jorgensen, E. (2002).

Bronchopneumonia and oral health in hospitalized older patients. A pilot study. *Gerodontology*, 19(2), 66-72.

Clinical Trial; Journal Article; D

AIMS: To correlate microbial findings obtained by bronchoalveolar lavage in pneumonia patients with the clinical situation of the oral cavity. **METHOD:** Quantitative aerobic and anaerobic cultures were carried out in

150 ml samples of bronchoalveolar lavage (BAL) obtained by means of an endoscope (Video Endoscope Pentax) inserted per os in the infected bronchus. MATERIAL: Twenty consecutive patients with a tentative clinical diagnosis of bronchopneumonia in whom BAL was carried out for diagnostic purposes. A clinical evaluation of the oral health status (oral hygiene, caries, periodontal diseases) was subsequently carried out. RESULTS: In seven edentulous subjects wearing complete dentures the culture of anaerobic microorganisms was negative or yielding less than 100 cfu/ml BAL. Two patients yielded high counts of *S. aureus* and one high counts of *P. aeruginosa*. In the 13 subjects with natural teeth left one showed high counts of *Veillonella* spp. (anaerobic) + *P. aeruginosa*, one high counts of *Veillonella* spp. + *S. aureus*, one high counts of *P. aeruginosa* + *S. aureus* and one high counts of *E. coli*. These four subjects showed poor oral hygiene, periodontal pockets and a BAL microflora consistent with periodontal pathology. CONCLUSION: The results of this pilot study suggest that microorganisms of denture plaque or associated with periodontal diseases may give rise to aspiration pneumonia in susceptible individuals.

REF ID: 3102

Level IV: Non-experimental study

Topic 3: Assessment

Ingram, S. S., Seo, P. H., Sloane, R., Francis, T., Clipp, E. C., & Doyle, M. E. et al. (2005). The association between oral health and general health and quality of life in older male cancer patients. *Journal of the American Geriatrics Society, 53(9), 1504-1509.*

Journal Article, Research, Tables/Charts

OBJECTIVES: To describe the long-term effects of oral health problems on quality of life (QoL), functional status, pain, and general health in older male cancer patients. DESIGN: Secondary analysis of a prospective observational study. SETTING: Community dwelling cancer patients served by a Department of Veterans Affairs hospital. PARTICIPANTS: One hundred fifty male cancer patients responded to the question "Do you have tooth or mouth problems making it hard to eat?" The relationship between patients answering "yes" and the following parameters was assessed: demographics, comorbid conditions, habits, activities of daily living, pain, anxiety, depression, social support, spirituality, QoL, and overall health ratings. MEASUREMENTS: Chi-square contingency tables for dichotomous variables, Cochran-Mantel-Haenszel for ordered categorical variables, and t tests for associations with continuous variables. RESULTS: The median age of respondents was 67. Those reporting tooth or mouth problems had had their cancer diagnosed on average 2.9 years before, and 83.3% were found clinically to be cancer free. Patients with these problems had significantly lower global ($P=.003$) and subscale scores on QoL analysis and higher levels of anxiety ($P<.001$) and depression ($P=.01$) than those without tooth or mouth problems; they also had significantly more pain ($P<.001$) and lower physical functioning ($P<.001$) and were more impaired in activities of daily living ($P<.001$). Those with tooth or mouth problems were more likely to describe their overall health as fair or poor ($P=.01$). Having cancer located in the head and neck region related significantly to having mouth or tooth problems ($P=.005$), but these problems were not associated with race, education, income, insurance coverage, age, comorbid conditions, alcohol consumption, tobacco or medication usage, type of cancer treatment, tumor stage at diagnosis or follow-up, perceived social support, or spirituality. CONCLUSION: Older male cancer patients with mouth or tooth problems making it hard to eat are more likely to have a lower QoL, poorer emotional health, lower levels of physical functioning, and greater pain than patients without these problems.

REF ID: 3239

Level III: Quasi-experimental study

Topic 3: Assessment

Isaksson, R., Soderfeldt, B., & Nederfors, T. (2003). Oral treatment need and oral treatment intention in a population enrolled in long-term care in nursing homes and home care. *Acta Odontologica Scandinavica, 61(1), 11-18.*

Journal Article; D; IM

The aim of the study was to evaluate the realistic oral treatment need in a population in southern Sweden enrolled in long-term care (LTC), in nursing homes (NH), or home care (HC), taking into consideration treatment intention. Every third individual enrolled in LTC was selected after proportionally stratifying a total of 866 subjects according to gender. Of these, 732 (85%) were available for a simple clinical oral health

evaluation in their own homes. Dental status, oral mucosal status, oral hygiene status, oral mucosal inflammation, and oral mucosal friction were assessed by observational examinations; suspected malignancies were also noted. Oral treatment need was expressed in accordance with the Treatment Need Index (TNI) as no, minor, major, or urgent, while treatment intention was expressed in accordance with the Treatment Intention Index (TII) as the aim to relieve, delay, maintain, or improve. The rationale for using the TII is to offer subjects in this generally frail population oral treatment at an appropriate level, taking their medical condition into consideration. It was found that 61% of the sample had a need not just for an oral health evaluation but also for additional dental treatment, 31% to be accomplished by prophylactic and 30% by reparative or emergency measures; only 1% were estimated to be in urgent need. Furthermore, one manifest and one suspected oral malignancy were found. The results indicate that realistic oral treatment need, guided by the examiner's estimation of the appropriate treatment intention, is modest in this population, but that regular oral screening is mandatory.

REF ID: 3179

Level V: Literature review

Topic 1: Risks

Jablonski, R. A., Munro, C. L., Grap, M. J., & Elswick, R. K. (2005). The role of biobehavioral, environmental, and social forces on oral health disparities in frail and functionally dependent nursing home elders. *Biological Research for Nursing*, 7(1), 75-82.

Journal Article; Review; IM

The purpose of this article is to review the literature on and discuss how interactions between bio-behavioral aging, nursing home environments, and social forces shaping current health care policies have contributed to oral health disparities in frail and functionally dependent elders who reside in nursing homes. Emerging empirical evidence suggests links between poor oral health with dental plaque deposition and systemic disease, such as nursing home-acquired pneumonia. The majority of nursing home residents lack either the functional ability or the mental capacity to perform their own mouth care and therefore must rely on others to perform mouth care for them. Certified nursing assistants (CNAs), who provide the majority of care activities, were unsure how to provide care to residents who engaged in care-resistant behaviors. The nurses who supervise the CNAs have limited knowledge regarding the provision of mouth care in general, and they specifically lack knowledge regarding the provision of mouth care to elders exhibiting care-resistant behavior. Elders in nursing homes have limited options when paying for dental care; Medicare does not generally cover routine dental care. Medicaid coverage varies widely between individual states; even when coverage exists, low Medicaid reimbursements discourage dentists from accepting Medicaid patients. The strategies needed to reduce these oral health disparities are complicated but not unrealistic. Investigators willing to embrace this cause will have no shortage of opportunities to test methods to improve the delivery of oral care as well as to monitor and reassess these methods.

REF ID: 3208

Level IV: Non-experimental study

Topic 1: Risks

Jainkittivong, A., Aneksuk, V., & Langlais, R. P. (2004). Medical health and medication use in elderly dental patients. *J.Contemp.Dent.Pract.*, 5(1), 31-41.

Journal Article; D; IM

The objectives of this study were to obtain information on the medical conditions and medications used among elderly Thai dental patients and to investigate the relationship between the findings in relation to age and sex. The information regarding medical conditions and medication use was obtained from interviews of 510 dental patients aged 60 years and older. The incidence of medical conditions was 82.5%; women had a significantly higher incidence of medical conditions (86.5%) than men (76.5%). The incidence of medical conditions did not differ among the three age groups. Overall, cardiovascular disease was the leading problem (33.7%) with hypertension being the major component (26.1%). The prevalent problems were bone/joint disorders (32.4%), allergies (18.2%), diabetes mellitus (14.5%), and eye and ear problems (14.3%). In our sample, 65.5% reported taking medications, with an average of 1.5 drug groups per person. The average number of medications taken increased as age increased. Women took medications more frequently than men

(70% vs. 58.5%). The four most prevalent drugs were cardiovascular agents (32%), endocrinologic drugs (14.5%), nutritional therapeutics (12.9%), and drugs acting on the musculoskeletal system (11.4%). The present study supports the findings of previous reports in that the presence of medical conditions is high in the elderly and the incidence of medication use increases with advancing age.

REF ID: 3221

Level II: Individual experimental study

Topic 2: Prevention

Johnson, G., & Almqvist, H. (2003). Non-invasive management of superficial root caries lesions in disabled and infirm patients. *Gerodontology*, 20(1), 9-14.

Clinical Trial; Controlled Clinical Trial; Journal Article; D

In disabled and infirm patients with limited, if any, capacity for independent oral self-care, it is difficult to control progression of root caries lesions. **OBJECTIVE:** To evaluate the effect of non-restorative cariostatic treatment on progression of active superficial root caries lesions (n = 56). **DESIGN:** Pilot study. **SETTING:** Department of Cariology, Institute of Odontology, Karolinska Institutet, Huddinge. **Subjects:** 15 physically-dependent patients. **INTERVENTION:** The patients were allotted to one of the following groups. Group 1, professional tooth cleaning and application of tap water flavoured with eucalyptus oil; Group 2, professional tooth cleaning and application of Cervitec, (1% chlorhexidine in thymol-containing varnish), Group 3, professional tooth cleaning and application of Cervitec and Fluor Protector (varnish containing 0.1% fluoride). Every three months for 18 months, each subject received the treatment twice within a 10-day interval. **MEASUREMENTS:** The status of the 56 root caries lesions was evaluated every six months using a root caries index based on visual and tactile criteria. The examiners were blind to which treatment group the patients belonged. **RESULTS:** In most subjects (14 out of 15), progression of root caries lesions was arrested. No statistically significant differences could be demonstrated between the three treatment groups. However, regardless of treatment regimen, there was a statistically significant difference between the greater number of subjects exhibiting no progression of root caries lesions and those with lesion progression, at 6 (p = 0.022), 12 (p = 0.006) and 18 months (p < 0.001). **CONCLUSION:** This pilot study suggests that in disabled and infirm patients regular professional tooth cleaning with a fluoride containing paste, with or without supplementary varnishing with chlorhexidine-thymol and/or fluoride can prevent further progression of existing superficial root caries lesions.

REF ID: 3278

Level V: Literature review

Topic 3: Assessment

Johnson, T. E., Boccia, A. D., & Strayer, M. S. (2001). Elder abuse and neglect: Detection, reporting, and intervention. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 21(4), 141-146.

Journal Article; Review; D

Dental providers are in an excellent position to identify elder abuse and neglect (EAN), yet they are often reluctant to report or intervene in cases of suspected elder maltreatment. This problem is widespread, and the negative impact of this dilemma cannot be ignored. In 1999, the American Dental Association's House of Delegates, through Resolution 44H-1999, urged constituent dental societies to educate their members about abuse and neglect and individual states' legal reporting requirements. The American Society for Geriatric Dentistry (ASGD), responding to a need to inform its members about this issue, requested this literature review on elder abuse and neglect. This paper emphasizes the role of the dental profession in ameliorating EAN and offers ASGD members recommendations to aid individual practitioners and staff in educating and assisting the profession in recognizing and reporting EAN.

REF ID: 3144

Level IV: Non-experimental study

Topic 3: Assessment

Jones, J. A., Kressin, N. R., Spiro, A. I. I. I., Randall, C. W., Miller, D. R., & Hayes, C. et al. (2001). Self-reported and clinical oral health in users of VA health care. *Journals of Gerontology.Series A:*

Biological Sciences and Medical Sciences, 56A(1), M55-62.

Journal Article, Research, Tables/Charts

BACKGROUND: This article describes the oral health of users of Veterans Administration (VA) health care using both clinical and self-report measures, and models relationships between these measures and self-perceived oral health. **METHODS:** We conducted a cross-sectional study of 538 male users of VA outpatient care in the Boston area. Questionnaires assessed self-reported oral health, oral-specific health-related quality of life, health behaviors, and sociodemographic information. Clinical data were collected on oral mucosa status, number of teeth and root tips, dental caries, and periodontal treatment need. We report clinical and self-reported oral health status by age group (era of military service). We regressed models of self-perceived oral health on clinical indices and self-reported measures of the impact of oral health on daily life, adjusting for sociodemographic characteristics and health behavior. **RESULTS:** Among those participants aged 65 to 91 years old, 2.8%, 18.7%, and 41.5% rated their oral health as excellent, very good, or good, respectively. Among 50- to 64-year-old men, the corresponding values were 1.4%, 18.5%, and 40.4%, while among those aged 22 to 49 years old, the values were 2.3%, 17%, and 34.1%. Tooth loss was common among users of VA care; 34% of those aged 65-90 years, 28% of those aged 50-64 years, and 8% of those aged 25-49 years had no teeth. Periodontal treatment needs were uniformly high among persons with teeth; mild mucosal change was common, and 10% had root tips. Regression models showed self-perceived oral health was better in persons with more teeth and recent dental treatment, and worse with tooth mobility, coronal decay, and more medical problems. Measures of the impact of oral conditions on daily life added significantly to the amount of explained variance in self-perceived oral health. **CONCLUSIONS:** Clinical conditions and the impact of oral health on daily life are important determinants of self-perceived oral health.

REF ID: 3138

Level IV: Non-experimental study

Topic 3: Assessment

Jones, J. A., Spiro, A. I. I., Miller, D. R., Garcia, R. I., & Kressin, N. R. (2002). Need for dental care in older veterans: Assessment of patient-based measures. *Journal of the American Geriatrics Society, 50(1), 163-168.*

Journal Article, Research, Tables/Charts

OBJECTIVES: There is a need for brief and accurate identification of older patients in need of dental care. This study examines the sensitivity and specificity of two screening instruments. **DESIGN:** Cross-sectional study conducted in older community-dwelling male veterans. **SETTING:** Four Department of Veterans Affairs (VA) clinics in greater Boston and the VA Dental Longitudinal Study (DLS). **PARTICIPANTS:** Two hundred thirty-two participants from the Veterans Health Study (VHS) who were outpatients in one of four Department of Veterans Affairs clinics in greater Boston and 206 participants from the VA DI-S, community-dwelling veterans who do not use VA for their health care. **MEASUREMENTS:** Self-report measures included a single-item global self-report of oral health (OH-1) and a sixitem dental screening measure called the D-E-N-T-A-L. The D-E-N-T-A-L queries whether participants have "Dry mouth, Eating or swallowing problems, Not had a dental examination in the last 2 years, Tooth or mouth problems, Altered eating habits because of teeth or mouth, or Lesions or sores in the mouth." The criterion standard for need for treatment was determined by a clinical examination. Sensitivities and specificities were calculated and receiver operating characteristic curves plotted to identify the best cutpoints for each measure. **RESULTS:** Need for care was nearly universal (97%) in the VHS and present in 64% of the DLS participants. The single-item self-report of oral health performed as well as the D-E-N-T-A-L in identifying persons in need of care. Compared with the clinical criterion, the OH-1 had a sensitivity of 0.75 and a specificity of 0.67 in identifying persons with severe need for denture care, whereas the D-E-N-T-A-L had a sensitivity of 0.80 and a specificity of 0.62 in identifying persons with severe periodontal need. **CONCLUSION:** Self-reports of fair or poor oral health are useful in identifying veterans in need of dental care, especially in populations with a large number of persons who do not usually use dental care. The D-E-N-T-A-L may also be useful as a self-screening measure and community education device to encourage older persons to seek regular dental care.

REF ID: 3177

Level V: Case report

Topic 1: Risks

Kalantzis, A., Marshman, Z., Falconer, D. T., Morgan, P. R., & Odell, E. W. (2005). Oral effects of low-dose methotrexate treatment. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*, 100(1), 52-62.

Journal Article; Review; D; IM

Methotrexate is used increasingly in low-dose regimens for a variety of conditions, particularly rheumatoid arthritis. While certain adverse effects of low-dose methotrexate have been described in detail, oral complications have received little attention. This article includes a summary of the uses and pharmacology of low-dose methotrexate and the mechanisms that lead to general and oral toxicity. The literature relevant to potential oral adverse effects is discussed and 7 illustrative cases are presented. The oral effects noted range from nonhealing ulcers to lymphoma-like lesions. Dental practitioners should be aware of the possible oral effects of low-dose methotrexate that have so far been largely unrecognized.

REF ID: 3090

Level IV: Non-experimental study

Topic 1: Risks

Keene JJ, J., Galasko, G. T., & Land, M. F. (2003). Antidepressant use in psychiatry and medicine: Importance for dental practice. *Journal of the American Dental Association: JADA*, 134(1), 71-79.

Journal Article, Research, Tables/Charts

BACKGROUND: Many dental patients receive antidepressant therapy. However, antidepressants taken with other drugs may increase the risk of complications that require special dental precautions and care.

METHODS: The authors conducted a retrospective study of 1,800 randomly selected patient records and evaluated the prevalence of using antidepressants and other medications concurrently. They analyzed antidepressant intake relative to drug classification and mechanism of action, age, sex and associated potential for clinical complications such as xerostomia, orthostatic hypotension and interaction with vasoconstrictors. The potential for additive adverse effects between antidepressants and other medications also was analyzed.

RESULTS: Three hundred eighty-one (21 percent) of the 1,800 patient records indicated that patients were being treated with 412 antidepressants. Female subjects outnumbered male subjects by an approximate 2.3:1 ratio. Selective serotonin reuptake inhibitors were most commonly prescribed, followed by tricyclic antidepressants, atypical and third-generation antidepressants, and monoamine oxidase inhibitors. Based on reported medication intake, almost 58 percent of subjects in the antidepressant group were receiving treatment with two or more medications that had the potential for producing xerostomia. Two hundred fifty-seven (67 percent) of the 381 records documented intake of an antidepressant or other medication with orthostatic hypotension potential. **CONCLUSIONS:** Three hundred eighty-one patients reported that they were receiving antidepressant therapy for psychiatric and other medical reasons. Potential adverse effects and interactions with other medications have direct implications for dental treatment. **CLINICAL IMPLICATIONS:** Patients receiving antidepressant therapy are at risk of developing xerostomia and orthostatic hypotension, as well as experiencing the adverse effects of interaction with vasoconstrictors. Dentists must take appropriate precautions in treating these patients.

REF ID: 3188

Level V: Literature Review

Topic 2: Prevention

Kikawada, M., Iwamoto, T., & Takasaki, M. (2005). Aspiration and infection in the elderly : Epidemiology, diagnosis and management. *Drugs & Aging*, 22(2), 115-130.

Journal Article; Review; IM

Aspiration of the oropharyngeal or gastric contents by elderly persons often leads to lower respiratory tract infections, such as aspiration pneumonia or pneumonitis. The existence of dysphagia and aspiration in elderly patients are important factors in the occurrence of aspiration pneumonia, but are not sufficient to cause aspiration pneumonia in the absence of other risk factors. Salivary flow and swallowing can eliminate Gram-negative bacilli from the oropharynx in healthy persons. However, elderly persons may have diminished production of saliva as a result of medications and oral/dental disease, leading to poor oral hygiene and oropharyngeal colonisation with pathogenic organisms. When dysphagic patients aspirate pathogenic bacteria

while swallowing food or liquids, they must also have decreased defences, such as impaired immunity or pulmonary clearance, in order to develop aspiration pneumonia. Elderly patients with cerebrovascular disease often have dysphagia that leads to an increased incidence of aspiration. It was previously reported that patients with silent cerebral infarction affecting the basal ganglia were more likely to experience subclinical aspiration and an increased incidence of pneumonia. Basal ganglia infarction leads to the impairment of dopamine metabolism and, as a consequence, a decrease of substance P in the glossopharyngeal nerve and sensory vagal nerves. Therefore, dysphagia and a decreased cough reflex may be induced by the impairment of dopamine metabolism in some elderly patients with cerebrovascular disease, suggesting that pharmaceutical agents which modulate dopamine metabolism may be able to improve swallowing and the cough reflex in patients with basal ganglia infarction. The main strategy for controlling aspiration and aspiration-related pulmonary infection in the elderly is to prevent aspiration of pathogenic bacteria along with the oropharyngeal or gastric contents. Because aspiration pneumonia in the elderly is related to certain risk factors, including dysphagia and aspiration, effective preventive measures involve various approaches, such as pharmacological therapy, swallowing training, dietary management, oral hygiene and positioning.

REF ID: 3153

Level II: Individual experimental study

Topic 2: Prevention

Kikutani, T., Enomoto, R., Tamura, F., Oyaizu, K., Suzuki, A., & Inaba, S. (2006). Effects of oral functional training for nutritional improvement in Japanese older people requiring long-term care. *Gerodontology, 23*(2), 93-98.

Journal Article; Randomized Controlled Trial; D

OBJECTIVES: The aim of this study was to evaluate the effect of oral functional training and nutrient supplements to improve the nutrition of malnourished elderly people in a nursing home. **BACKGROUND:** Malnutrition is a frequent problem in the elderly requiring long-term care; however, it is not clear whether oral functional training can be effective to improve nutrition. **SUBJECTS AND METHODS:** Fourteen subjects of 82 residents (mean age 85.7±6.2 years) in a nursing home, who had a serum albumin level of ≤3.8 g/dl and understood the purpose of this study, were randomly divided into two groups of seven: one group served as the supplement group (mean age 87.0±4.9 years) to which a high-calorie and high-protein diet was provided, and the other as the oral training plus supplement group (mean age 84.6±10.1 years) to which oral functional training was given by a dental hygienist once a week as well as the above diet. Nutritional status was evaluated using serum biochemical values as indices at 4 months after the start of the intervention. **RESULTS:** In the supplement group, serum albumin was 3.44±0.36 g/dl at the start of the study (before intervention) and 3.24±0.45 g/dl at 4 months after intervention. In the oral training plus supplement group, it was 3.56±0.22 g/dl before intervention and significantly increased to 3.70±0.33 g/dl after intervention ($p<0.05$; Wilcoxon signed-rank test). **CONCLUSION:** Nutritional supplements alone were not adequate, but with oral functional training to maintain and improve feeding function, nutritional improvement in the elderly could be observed.

REF ID: 3080

Level IV: Non-experimental study

Topic 1: Risks

Kiyak, H. A., Kamoh, A., Persson, R. E., & Persson, G. R. (2002). Ethnicity and oral health in community-dwelling older adults. *General Dentistry, 50*(6), 513-518.

Journal Article, Research, Tables/Charts

Epidemiological studies consistently have found differences in oral health status between white and non-white elders. This has been attributed primarily to lack of access to dental care, especially preventive services. The study reported here examined psychosocial factors in an attempt to explain these differences.

REF ID: 3173

Level V: Literature review

Topic 1: Risks

Kiyak, H. A., & Reichmuth, M. (2005). Barriers to and enablers of older adults' use of dental services. *Journal of Dental Education, 69*(9), 975-986.

Journal Article; Review; D; IM

The theme of the Elders' Oral Health Summit is older adults' access to dental care and how this situation can be improved for future cohorts. A major question is whether older adults today, as well as baby boomers who will be entering their seventies within the next decade, will demand dental care as part of their overall well-being. The current cohort of elders varies widely in its use of dental services, from regular preventive users to non-users who report that they have not been to a dentist in more than twenty years. In 1999, 53.5 percent of older adults reported that they had visited a dentist, the lowest rate of any age group beyond eighteen. This article examines some determinants of older persons' dental service utilization, both barriers and enablers, as a means of understanding why some people continue seeking preventive dental care throughout their lives while others are lifelong irregular users and still others discontinue regular use after retirement or relocation to a new community or long-term care facility. Based on the epidemiological and psychosocial literature available on this topic, barriers and enablers include cohort and age, race and ethnicity, income and education, availability of dental and medical insurance, urban vs. rural residence, physical access to a dental office, and systemic and functional health. Attitudes toward oral health and dental care and other psychosocial variables may override some of these demographic and structural variables. Research in medical and dental service utilization offers insights into the relative predictive ability of these variables. Dental providers can also be potent enablers or barriers to older adults' access to dental care. Each of these factors plays a role in older adults' use of dental services. Under different situations some serve as both barriers and enablers.

REF ID: 3119

Level IV: Non-experimental study

Topic 3: Assessment

Klassen, A. C., Juon, H., Alberg, A. J., Reid, B. C., & Meissner, H. I. (2003). Opportunities for oral cancer screening among older african-american women. *Preventive Medicine, 37*(5), 499-506.

Journal Article, Research, Tables/Charts

BACKGROUND: Older persons with smoking histories are important targets for oral cancer screening. Although older persons in low-income communities often lack regular dental care, little is known about the characteristics of groups at greatest risk for poor screening. **METHODS:** Survey data from 576 African-American women aged 45-93 were used to identify predictors of smoking and recency and type of dental care. **RESULTS:** Fifty-nine percent of respondents were current or former smokers, and 62% reported dental care within the past 3 years. Among smokers, no recent dental care was associated with older age, worse health, not working, no regular medical provider, and no recent mammography. **CONCLUSIONS:** These results suggest that episodic visits to non dentist providers offer opportunities for oral screening in high-risk populations. Copyright (C) 2003 by Elsevier Science (USA).

REF ID: 3258

Level V: Literature Review

Topic 4: Management

Kocaelli, H., Yaltirik, M., Yargic, L. I., & Ozbas, H. (2002). Alzheimer's disease and dental management. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics, 93*(5), 521-524.

Journal Article; Review; D; IM

Alzheimer's disease (AD) is a major disorder of old age and the most common cause of dementia. Dementia is loss of intelligence, memory, and cognitive functions. It is usually associated with aging, but there are many possible causes. Older adults are the most rapidly growing segment of the population. To maintain lifelong good oral health, the elderly need regular dental care. This review of AD summarizes the causes, epidemiology, diagnosis, and dental management of patients with AD.

REF ID: 3276

Level II: Individual Experimental study

Topic 2: Prevention

Krall, E. A., Wehler, C., Garcia, R. I., Harris, S. S., & Dawson-Hughes, B. (2001). Calcium and vitamin D supplements reduce tooth loss in the elderly. *The American Journal of Medicine, 111*(6), 452-456.

Clinical Trial; Journal Article; Randomized Controlled Trial; AIM; IM

PURPOSE: Oral bone and tooth loss are correlated with bone loss at nonoral sites. Calcium and vitamin D supplementation slow the rate of bone loss from various skeletal sites, but it is not known if intake of these nutrients affects oral bone and, in turn, tooth retention. **SUBJECTS AND METHODS:** Tooth loss was examined in 145 healthy subjects aged 65 years and older who completed a 3-year, randomized, placebo-controlled trial of the effect of calcium and vitamin D supplementation on bone loss from the hip, as well as a 2-year follow-up study after discontinuation of study supplements. Teeth were counted at 18 months and 5 years. A comprehensive oral examination at 5 years included assessment of caries, oral hygiene, and periodontal disease. The odds ratio (OR) and 95% confidence interval (CI) of tooth loss were estimated by stepwise multivariate logistic regression. Initial age (mean +/- SD) of subjects was 71 +/- 5 years, and the number of teeth remaining was 22 +/- 7. **RESULTS:** During the randomized trial, 11 of the 82 subjects (13%) taking supplements and 17 of the 63 subjects (27%) taking placebo lost one or more teeth (OR = 0.4; 95% CI: 0.2 to 0.9). During the 2-year follow-up period, 31 of the 77 subjects (40%) with total calcium intake of at least 1000 mg per day lost one or more teeth compared with 40 of the 68 subjects (59%) who consumed less (OR = 0.5; 95% CI: 0.2 to 0.9). **CONCLUSION:** These findings suggest that intake levels of calcium and vitamin D aimed at preventing osteoporosis have a beneficial effect on tooth retention.

REF ID: 3087

Level IV: Non-experimental study

Topic 1: Risks

Kressin, N. R., Reisine, S., Spiro, A. I. I., & Jones, J. A. (2001). Is negative affectivity associated with oral quality of life? *Community Dentistry and Oral Epidemiology*, 29(6), 412-423.

Journal Article, Research, Tables/Charts

OBJECTIVES: The personality trait of negative affectivity (NA) is associated with reports of worse physical health, more symptoms and worse health-related quality of life but its associations with oral quality of life (OQOL) are unexplored. In this study we examined the association of NA with OQOL. **METHODS:** We drew on data from two samples of older men: The VA Dental Longitudinal Study (DLS; n=177) and the Veterans Health Study (VHS; n=514), which included three measures of oral quality of life: the Oral Health-Related Quality of Life Measure (OHQOL), the Oral Health Impact Profile (OHIP), and the Geriatric Oral Health Assessment Instrument (GOHAI). For each OQOL measure, and the GOHAI and OHIP subscales, two regression models were estimated to examine the marginal change in variance due to NA: the first model included age, number of teeth, and self-rated oral health, and the second added NA. **RESULTS:** In both bivariate and multivariate analyses, higher NA was consistently associated with worse scores on the OQOL measures. In the regression analyses, NA explained an additional.01 to 18% of the variance in OQOL, explaining the most variance in the OHIP and the least in the OHQOL. The addition of NA explained more variance in the more subjective, psychologically oriented GOHAI and OHIP subscales than it did in the more objective, physical function oriented subscales. **CONCLUSIONS:** Psychosocial factors such as personality are significantly associated with quality of life ratings. Such associations should be taken into account when OQOL measurements are used and interpreted.

REF ID: 3110

Level IV: Non-experimental study

Topic 3: Assessment

Kruger, E., Tennant, M., Badrian, B., Gorgy, S., & Bruce, D. (2004). Oral health of aged inpatients. *Australasian Journal on Ageing*, 23(4), 172-176.

Journal Article, Research, Tables/Charts

REF ID: 3125

Level IV: Non-experimental study

Topic 4: Management

Kubilius, B., Northwood, M., & Morreale, J. (2003). Promoting oral hygiene: A pilot project partnership. *Perspectives*, 27(1), 14-18.

Journal Article, Research, Tables/Charts

REF ID: 3232

Level V: Literature review

Topic 4: Management

Kulich, R. J., Dyer, J., Driscoll, S., & Mehta, N. (2003). Managing pain for the elderly. *Journal of the Massachusetts Dental Society*, 52(1), 22-27.

Journal Article; Review; D

REF ID: 3115

Level III: Quasi-experimental study

Topic 1: Risks

Lalla, E., Park, D. B., Papapanoi, P. N., & Lamster, I. B. (2004). Oral disease burden in northern manhattan patients with diabetes mellitus. *American Journal of Public Health*, 94(5), 755-758.

Journal Article, Research, Tables/Charts

OBJECTIVES: We explored the association between diabetes mellitus and oral disease in a low-socioeconomic-status urban population. METHODS: Dental records of 150 adults with diabetes and 150 nondiabetic controls from the dental clinic at Columbia University in Northern Manhattan matched by age and gender were studied. RESULTS: There was a 50% increase in alveolar bone loss in diabetic patients compared with nondiabetic controls. Diabetes, increasing age, male gender, and use of tobacco products had a statistically significant effect on bone loss. CONCLUSIONS: Our findings provide evidence that diabetes is an added risk for oral disease in this low-income, underserved population of Northern Manhattan. Oral disease prevention and treatment programs may need to be part of the standards of continuing care for patients with diabetes

REF ID: 3277

Level V: Literature review

Topic 4: Management

Lee, E. E., Thomas, C. A., & Vu, T. (2001). Mobile and portable dentistry: Alternative treatment services for the elderly. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 21(4), 153-155.

Journal Article; Review; D

With the rapidly expanding geriatric population in the United States, the demand for geriatric dentistry is rising. With the financial, transportation, and motivational barriers the geriatric population faces, it can be difficult for them to seek dental treatment in a traditional setting. Mobile and portable dental units can be used as alternative methods to provide dental care to the geriatric population. Mobile and portable dental units offer advantages such as providing community outreach, increasing personal satisfaction for geriatric clients and dental professionals, and providing dental care to those who would otherwise not receive treatment due to some of the barriers. Although mobile and portable dental units are ideal for long-term facilities, disadvantages do exist in implementing the use of these systems. These include the initial cost of implementing such a unit, limitation of treatment options, the number of clients seen in a day, and maintenance for the unit. Until more research can be done to find ways to improve the quality of dental care for the geriatric population, these units seem to be a reasonable alternative to the traditional approach to providing the elderly with the dental care they require.

REF ID: 3172

Level V: Literature review

Topic 4: Management

Little, J. W. (2005). Dental management of patients with alzheimer's disease. *General Dentistry*, 53(4), 289-96; quiz 297.

Journal Article; Review; D

This article reviews the recent literature regarding the epidemiology, etiology, pathophysiology, diagnosis, and treatment of Alzheimer's disease. The dental management of patients with Alzheimer's disease is discussed in some detail.

REF ID: 3212

Level IV: Non-experimental study

Topic 3: Assessment

Locker, D. (2003). Dental status, xerostomia and the oral health-related quality of life of an elderly institutionalized population. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 23(3), 86-93.

Journal Article; D

The author examined the relative effects of tooth loss and xerostomia on the oral health-related quality of life of an elderly, medically compromised population, living in a long-term care setting. Data were collected from 225 subjects (mean age: 83 years) via a questionnaire and review of dental charts. Oral health-related quality of life was assessed using self-ratings, satisfaction ratings, an index of chewing capacity, the GOHAI, and OHIP-14. Almost all participants had one or more chronic medical conditions and were taking prescribed medications. Two-thirds of the study group was dentulous with a mean number of 16 remaining teeth. One-third of the participants had scores on a xerostomia index indicating marked oral dryness. In bivariate and multivariate analyses, xerostomia index scores were significantly associated with all oral health-related quality of life outcomes. Dental status was associated with chewing capacity only. The results suggest that xerostomia has an important influence on the well-being and quality of life of this population.

REF ID: 3097

Level IV: Non-experimental study

Topic 2: Prevention

Locker, D. (2001). Does dental care improve the oral health of older adults? *Community Dental Health*, 18(1), 7-15.

Journal Article, Research, Tables/Charts

OBJECTIVE: To assess the relationship between self-perceived change in oral health status and the provision of dental treatment in an older adult population. **DESIGN:** A longitudinal study with data collection at baseline and after three years. Information on change in oral health was obtained by interviews with study subjects and information on dental treatment over three years was obtained from subjects' dentists.

SUBJECTS: Nine hundred and seven subjects took part at baseline and 611 at follow-up. Of the latter, 495 reported at least one dental visit during the three-year observation period and dental treatment information was available for 408. Outcome measures Global transition judgements and change scores derived from four oral health indexes were used to assess change in oral health status. **RESULTS:** Over the three-year period, one-tenth of subjects reported that their oral health had improved and one-fifth that it had deteriorated. Those who improved made significantly more dental visits and received significantly more dental services than those who deteriorated or did not change ($P < 0.0001$). They also received a broader range of diagnostic, preventive and therapeutic services. The association between change and dental service provision remained after controlling for other potential determinants of oral health. **CONCLUSION:** The study suggests that improvements in the oral health of older adults depend upon access to comprehensive dental treatments which can address fully their clinical and self-perceived needs.

REF ID: 3064

Level IV: Non-experimental study

Topic 3: Assessment

Locker, D., & Gibson, B. (2005). Discrepancies between self-ratings of and satisfaction with oral health in two older adult populations. *Community Dentistry and Oral Epidemiology*, 33(4), 280-288.

Journal Article, Pictorial, Research, Tables/Charts

OBJECTIVES: General health perceptions, usually measured by means of single-item indicators, are commonly included in health and oral health surveys. The aim of the study reported here was to assess the relationship between self-rated oral health and satisfaction with oral health in two studies of older adult populations. **METHODS:** Participants in Study 1 were aged 50 years and over, the majority of whom had multiple chronic medical conditions and disabilities and lived within a multi-level geriatric care setting. They were recruited when attending a clinic in that setting for their annual dental screening. Participants in Study 2 were somewhat healthier community dwelling individuals, also aged 50 years and older, who took part. They were originally recruited by means of a telephone survey based on random-digit dialing. For Study 1, data were collected by means of personal interviews and a review of dental clinic charts, while for Study 2

personal interviews, clinical examination and self-completed questionnaires were used. Measures included self-rated oral health, satisfaction with oral health, oral health-related quality of life (OHRQoL) and tooth loss. RESULTS: Data were obtained from 225 persons in Study 1 and 541 in Study 2. In both studies there was a significant association between self-ratings of oral health and satisfaction with oral health. However, also in both studies there was a discrepancy between the measures: approximately 10% of those with favourable oral health ratings were dissatisfied while approximately half of those with unfavourable ratings were satisfied. Those with apparently discordant responses had significantly higher scores on OHRQoL measures such as the GOHAI and the OHIP-14 than those with concordant responses. In Study 2, a similar discrepancy between self-rated general health and satisfaction with general health was also observed. CONCLUSIONS: There is degree of discordance between self-ratings of and satisfaction with both oral and general health status in the older adult populations studied here. This may be because of the expectations concerning health in later life. More needs to be known about the frames of reference people use in constructing their responses to questions designed to assess health perceptions.

REF ID: 3209

Level IV: Non-experimental study

Topic 3: Assessment

Locker, D., Jokovic, A., & Clarke, M. (2004). Assessing the responsiveness of measures of oral health-related quality of life. *Community Dentistry and Oral Epidemiology*, 32(1), 10-18.

Journal Article; Validation Studies; D; IM

OBJECTIVES: This paper illustrates ways of assessing the responsiveness of measures of oral health-related quality of life (OHRQoL) by examining the sensitivity of the oral health impact profile (OHIP)-14 to change when used to evaluate a dental care program for the elderly. METHODS: One hundred and sixteen elderly patients attending four municipally funded dental clinics completed a copy of the OHIP-14 prior to treatment and 1 month after the completion of treatment. The post-treatment questionnaire also included a global transition judgement that assessed subjects' perceptions of change in their oral health following treatment at the clinics. Change scores were calculated by subtracting post-treatment OHIP-14 scores from pre-treatment scores. The longitudinal construct validity of these change scores were assessed by means of their association with the global transition judgements. Measures of responsiveness included effect sizes for the change scores, the minimal important difference, and Guyatt's responsiveness index. An receiver operating characteristic (ROC) curve was constructed to determine the accuracy of the change scores in predicting whether patients had improved or not as a result of the treatment. RESULTS: Based on the global transition judgements, 60.2% of subjects reported improved oral health, 33.6% reported no change, and only 6.2% reported that it was a little worse. These changes are reflected in mean pre- and post-treatment OHIP-14 scores that declined from 15.8 to 11.5 ($P < 0.001$). Mean change scores showed a consistent gradient in the expected direction across categories of the global transition judgement, but differences between the groups were not significant. However, paired t-tests showed no significant differences in the pre- and post-treatment scores of stable subjects, but showed significant declines for subjects who reported improvement. Analysis of data from stable subjects indicated that OHIP-14 had excellent test-retest reliability with an intraclass correlation coefficient (ICC) of 0.84. Effect size based on change scores for all subjects and subgroups of subjects were small to moderate. The ROC analysis indicated that OHIP-14 change scores were not good "diagnostic tests" of improvement. The minimal important difference for the OHIP-14 was of 5-scale points, but detecting this difference would require relatively large sample sizes. CONCLUSIONS: OHIP-14 appeared to be responsive to change. However, the magnitude of change that it detected in the context described here was modest, probably because it was designed primarily as a discriminative measure. The psychometric properties of the global transition judgements that often provide the "gold standard" for responsiveness studies need to be established.

REF ID: 3263

Level IV: Non-experimental study

Topic 1: Risks

Locker, D., Matear, D., & Lawrence, H. (2002). General health status and changes in chewing ability in older Canadians over seven years. *Journal of Public Health Dentistry*, 62(2), 70-77.

Journal Article; D; IM

OBJECTIVES: The purpose of this study was to describe the onset of and recovery from chewing problems in an older adult population over a seven-year period and to describe factors associated with these changes. Of particular interest was the relationship between general health and changes in oral functioning. **METHODS:** The data came from a longitudinal study of community-dwelling individuals who were aged 50 years and older when first recruited. Data were collected at baseline (n = 907) and at three (n = 611) and seven-year (n = 425) follow-ups. Oral function was assessed by means of a six-item index of chewing ability. Data were weighted to account for loss to follow-up using weights derived from the seven-year response proportions for dentate and edentulous subjects. Logistic regression analysis using backward stepwise selection was used to identify predictors of onset and recovery. **RESULTS:** At baseline, 25 percent of subjects reported a problem chewing. This rose to 26 percent at three years and 34 percent at seven years. The seven-year incidence of chewing dysfunction was 19 percent. Of those with a chewing problem at baseline, 21 percent did not have a problem at seven years. A logistic regression model predicting the seven-year incidence of chewing problems indicated that subjects aged 65 years or older, the edentulous, those rating their oral health as poor, those without dental insurance and those without a regular source of dental care were more likely to be an incident case. In addition, a variable denoting the number of chronic medical conditions at baseline also entered the model. A logistic regression model predicting recovery indicated that older subjects, the edentulous, those from low-income households, and those with limitations in activities of daily living were less likely to recover over the observation period. **CONCLUSION:** The results of this study indicate a marked increase in the prevalence of chewing problems in this older adult population over the seven-year observation period. Poorer general health at baseline increased the probability of the onset of a chewing problem and decreased the probability of recovery.

REF ID: 3096

Level IV: Non-experimental study

Topic 3: Assessment

Locker, D., Matear, D., Stephens, M., & Jokovic, A. (2002). Oral health-related quality of life of a population of medically compromised elderly people. *Community Dental Health, 19(2), 90-97.*

Journal Article, Research, Tables/Charts

Objectives: The purpose of this study was to assess the oral health-related quality of life of a population of medically compromised individuals most of whom lived within a long-term care centre. **Design:** A cross-sectional survey with data collected by means of a personal interview and a review of dental records. **Subjects** 225 subjects with a mean age of 83 years, most of whom were medically compromised and lived within a multi-level geriatric care setting. **Measures:** The questionnaire included two single-item indicators of oral health and two oral health indexes; namely, the Geriatric Oral Health Assessment Index (GOHAI) and the short form Oral Health Impact Profile (OHIP-14). It also included three measures intended to tap the broader construct of quality of life; namely morale, perceived life stress and life satisfaction. **Results:** The main oral problems of this population were missing teeth, dry mouth and limitations in chewing ability. One third rated their oral health as only fair or poor and 20% were dissatisfied with their oral health status. Using the GOHAI, 53% reported experiencing one or more functional or psychosocial problems 'very often' or 'all the time'. Since the OHIP-14 taps more severe impacts, functional and psychosocial problems were reported by 17%. All four oral health indicators were significantly associated with the quality of life measures, indicating that those with poor self-perceived oral health had lower morale, more life stress and lower levels of life satisfaction. These associations remained after controlling for other potential influences on quality of life such as general health, income and marital status. **Conclusion:** These data suggests that oral disorders have a significant effect on the well-being and life satisfaction of the individuals in the study even though they are characterised by high rates of chronic physical and mental conditions and physical disabilities. Consequently, access to appropriate oral health care is likely to improve overall quality of life. The data also suggest that instruments such as the GOHAI and OHIP-14 are measuring aspects of life that these individuals regard as being important.

REF ID: 3088

Level IV: Non-experimental study

Topic 3: Assessment

Locker, D., Matear, D., Stephens, M., Lawrence, H., & Payne, B. (2001). Comparison of the GOHAI and OHIP-14 as measures of the oral health-related quality of life of the elderly. *Community Dentistry and Oral Epidemiology*, 29(5), 373-381.

Journal Article, Research, Tables/Charts

OBJECTIVES: This paper compares the performance of the GOHAI and the OHIP-14 as measures of the oral health-related quality of life of the compromised elderly. **METHODS:** Data were obtained from a cross-sectional survey of 225 participants, most of whom lived in a large geriatric care centre. **RESULTS:** The mean age of subjects was 83 years and the majority had one or more chronic medical conditions and physical disabilities. Their main oral problems were high rates of tooth loss and xerostomia. Additive and simple count methods were used to derive GOHAI and OHIP-14 scores. Using the additive method, 8.4% had a GOHAI score of zero and 30.3% an OHIP-14 score of zero. Using the simple count method the percentage with a score of zero was 15.1% and 45.8%. Both measures discriminated between dentate subjects with and without one or more dentures, with and without a chewing problem and with and without dry mouth. Both also showed significant associations with self-rated oral health and satisfaction with oral health status. Associations tended to be stronger between GOHAI scores and these variables. The measures were equally good at predicting overall psychological well-being and life satisfaction. Although the GOHAI identified more oral functional and psychosocial impacts than the OHIP-14, neither was markedly superior to the other when used as discriminatory measures. However, the high prevalence of subjects with zero scores may compromise the ability of the OHIP-14 to detect within-subject change.

REF ID: 3227

Level I: Systematic Review

Topic 2: Prevention

Loeb, M. B., Becker, M., Eady, A., & Walker-Dilks, C. (2003). Interventions to prevent aspiration pneumonia in older adults: A systematic review. *Journal of the American Geriatrics Society*, 51(7), 1018-1022.

Journal Article; Review; IM

A systematic review was conducted to assess the effectiveness of the following interventions for prevention of aspiration pneumonia (AP) in older adults: compensatory strategy/positioning changes, dietary interventions, pharmacologic therapies, oral hygiene, and tube feeding. Data sources included a key word search of the MEDLINE, EMBASE, Cochrane Library, CINAHL, and HealthSTAR databases and hand searches of six journals. Reference lists of relevant primary and review articles were searched. Studies included were randomized, controlled trials (RCTs) enrolling adults aged 65 and older at risk of and assessed for AP. Two investigators extracted data on population, intervention, outcomes, and methodological quality. Of the 17 identified RCTs, eight met the selection criteria, two addressed dietary management or compensatory swallowing, two assessed pharmacological therapies, one assessed oral hygiene, and three assessed tube feeding. None of the eight trials reported use of blinding, and allocation concealment was unclear in five. Use of amantadine prevented pneumonia in one trial of nursing home residents. The antithrombotic agent cilostazol prevented AP in another trial but resulted in excessive bleeding. Insufficient data exist to determine the effectiveness of positioning strategies, modified diets, oral hygiene, feeding tube placement, or delivery of food in preventing AP. Considering how common the problem of AP is in older adults, larger, high-quality RCTs on the effectiveness of preventive interventions are warranted.

REF ID: 3157

Level V: Literature review

Topic 6: Comprehensive

MacDonald, D. E. (2006). Principles of geriatric dentistry and their application to the older adult with a physical disability. *Clinics in Geriatric Medicine*, 22(2), 413-34; x.

Journal Article; Review; IM

The older adult living with a physical disability faces many daily challenges. Limited hand function or impaired cognition often has profound effects on activities of daily life including oral hygiene. This article explores age-related changes in dentition and common causes of pathology of the oral cavity with special

emphasis in populations with impaired hand function or cognition. This article will also assist the treating physician as it relates to oral diagnosis and patient management.

REF ID: 3067

Level IV: Non-experimental study

Topic 2: Risks

Macek, M. D., Cohen, L. A., Reid, B. C., & Manski, R. J. (2004). Trends. dental visits among older U.S. adults, 1999: The roles of dentition status and cost. *Journal of the American Dental Association: JADA*, 135(8), 1154-1166.

Journal Article, Algorithm, CEU, Exam Questions, Research, Tables/Charts

Background. The proportion of older adults in the United States will continue to grow during the next few decades. Aging populations will bring unique challenges to dentistry. Understanding dental visit patterns will help the profession become prepared. Methods. The authors used data from the 1999 National Health Interview Survey to describe dental visit patterns among adults aged 55 years or older. Outcome variables included presence of a dental visit in the previous year, reasons for the last dental visit and reasons for not having had a dental visit. Descriptor variables included age, sex, race/ethnicity, poverty status, region, private dental insurance status and dentition status. Results. Approximately 71 percent of dentate and 20 percent of edentulous adults had had a dental visit in the previous year. Among dentate adults, age, sex, race/ethnicity, poverty status, region and dental insurance were associated with visits. Among edentulous adults, age, poverty status and dental insurance were associated with visits. Among all older adults, the main reason for a visit was preventive/ diagnostic. Edentulous adults also were likely to visit for problems. The majority of adults who had not had a dental visit did not recognize a need for one; however, dentate adults were more likely to recognize a need than were edentulous adults. For those who recognized a need but did not visit a dentist, cost was a prevalent barrier. Conclusions. Among those who visited a dentist, most went for a diagnostic/preventive procedure. Among those who did not visit a dentist, most did not recognize a need to do so. Cost remains a serious barrier. Clinical Implications. Some older adults recognize a need to visit a dentist, whereas others (particularly the edentulous) do not. As more adults recognize their oral health care needs, cost may prevent some from seeking care.

REF ID: 3184

Level V: Literature review

Topic 2: Prevention

Macentee, M. I. (2005). Caring for elderly long-term care patients: Oral health-related concerns and issues. *Dental Clinics of North America*, 49(2), 429-443.

Journal Article; Review; IM

Much work is needed to resolve the many issues of prevention in the complex environment of long-term care facilities and to provide effective curative care for individuals, no matter how frail, who could benefit from comprehensive dental services.

REF ID: 3201

Level IV: Non-experimental study

Topic 3: Assessment

Maraki, D., Becker, J., & Boecking, A. (2004). Cytologic and DNA-cytometric very early diagnosis of oral cancer. *Journal of Oral Pathology & Medicine : Official Publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 33(7), 398-404.

Clinical Trial; Controlled Clinical Trial; Journal Article; D; IM

BACKGROUND: The aim of this study was to evaluate the diagnostic accuracy of exfoliative cytology (EC) and DNA-image cytometry applied to suspicious oral lesions compared with synchronous histology. METHODS: Brush- and scalpel biopsies were obtained from 98 patients with suspicious oral lesions. In cases, in which EC revealed malignant or suspicious cells, nuclear DNA-contents were measured using a TV image analysis system. RESULTS: Among 98 oral lesions both cytological and histological diagnosis showed no sign of malignancy or dysplasia in 75. In 23 cases cytology yielded tumor cell-positive (15), suspicious (four) or doubtful (four) results. DNA-cytometry showed aneuploidy in 19 of these. The comparison between cytological diagnosis combined with DNA-cytometry and biopsy-histology resulted in a sensitivity of 100%

and a specificity of 97.4%. **CONCLUSION:** In conclusion, cytology with DNA-cytometry is a highly sensitive, specific and non-invasive method for the early diagnosis of oral epithelial neoplasia, showing excellent compliance among patients.

REF ID: 3226

Level V: Literature review

Topic 6: Comprehensive

Marik, P. E., & Kaplan, D. (2003). Aspiration pneumonia and dysphagia in the elderly. *Chest, 124(1), 328-336.*

Journal Article; Review; AIM; IM

Community-acquired pneumonia (CAP) is a major cause of morbidity and mortality in the elderly, and the leading cause of death among residents of nursing homes. Oropharyngeal aspiration is an important etiologic factor leading to pneumonia in the elderly. The incidence of cerebrovascular and degenerative neurologic diseases increase with aging, and these disorders are associated with dysphagia and an impaired cough reflex with the increased likelihood of oropharyngeal aspiration. Elderly patients with clinical signs suggestive of dysphagia and/or who have CAP should be referred for a swallow evaluation. Patients with dysphagia require a multidisciplinary approach to swallowing management. This may include swallow therapy, dietary modification, aggressive oral care, and consideration for treatment with an angiotensin-converting enzyme inhibitor.

REF ID: 3092

Level IV: Non-experimental study

Topic 3: Assessment

Marshall, T. A., Warren, J. J., Hand, J. S., Xie, X., & Stumbo, P. J. (2002). Oral health, nutrient intake and dietary quality in the very old. *Journal of the American Dental Association: JADA, 133(10), 1369-72, 1373-9, 1425-8.*

Journal Article, CEU, Exam Questions, Research, Tables/Charts

BACKGROUND: Limited food choices and inadequate nutrient intake are linked to poor oral health. The authors describe relationships between dietary variety, nutrient intake and oral health measures in community-dwelling, rural Iowans aged 79 years and older. **METHODS:** Dental examinations were conducted by trained and calibrated examiners, and trained interviewers completed standardized interviews in subjects' homes. Subjects (n = 220) then completed three-day dietary records. Adequate nutrient intakes were defined using the Dietary Reference Intakes of the Food and Nutrition Board of the National Academy of Sciences. **RESULTS:** Mean daily nutrient intakes were significantly lower in subjects who had fewer natural or functional teeth and ill-fitting mandibular dentures than in subjects who had more teeth or did not have these problems. Adequacy of intakes was lower in subjects who had fewer natural or functional teeth and ill-fitting mandibular dentures. Mean daily nutrient intakes did not differ between subjects with well-fitting dentures (either complete or partial) and subjects with natural teeth. Neither mean daily intake nor adequacy of intake was associated with subjects' perceptions of oral health problems, chewing difficulties or temperature sensitivity. **CONCLUSIONS:** The presence of natural teeth and well-fitting dentures were associated with higher and more varied nutrient intakes and greater dietary quality in the oldest old Iowans sampled. **Clinical Implications.** Maintenance of natural dentition or provision and maintenance of adequate mandibular prostheses are important for nutrient intakes to support systemic health.

REF ID: 3062

Level IV: Non-experimental study

Topic 4: Management

Matear, D. W., & Barbaro, J. (2006). Caregiver perspectives in oral healthcare in an institutionalised elderly population without access to dental services: A pilot study. *Journal of the Royal Society for the Promotion of Health, 126(1), 28-32.*

Journal Article, Research, Tables/Charts

Aim: The provision of dental services to elderly populations is a complicated area. When clients are cognitively impaired, a new set of variables are introduced as care can be influenced by designated family members, caregivers or administrators, who are responsible for the oral health care of the client and may

influence the types of treatment the client will receive. Differences in attitudes and perceptions, with respect to oral health, may lead to better or worse access to care. The goals of this study are: a) to gain a better understanding of the perceptions which may govern access and barriers to care within the institutionalised elderly population; and b) to improve information on where and how to target educational and service resources, in order to reduce barriers to care. Method: A convenience (non-randomised) sample of 100 residents with caregivers was selected from nursing homes without organised access to oral healthcare services. A structured interview was conducted with 40 family members. Questions explored the importance and priorities of dental services for elderly people in institutions. Results: Services which family members deemed of highest importance were dentures (both to replace teeth and adjustments on existing dentures), pain relief, emergency dentistry, fillings, cleanings, check-ups, tooth removal and treatment for advanced gum disease. Services that family members felt were less important were complex restorations, cleaning instruction to caregivers and seniors, and services by a specialist. Services considered to be of least importance were root canal treatment and implants. The top service priorities identified by the sample of family members included: cleanings to prevent mouth disease; check-ups including X-rays; fillings; dentures to replace teeth; and dental treatment to relieve pain. Conclusion: This study found that family members and caregivers would like a basic dental service including check-ups and preventive care, with restorative, denture and surgical intervention when required.

REF ID: 3190

Level IV: Non-experimental study

Topic 4.4: Management-products

Matear, D. W., & Barbaro, J. (2005). Effectiveness of saliva substitute products in the treatment of dry mouth in the elderly: A pilot study. *Journal of the Royal Society of Health, 125(1), 35-41.*

Clinical Trial; Journal Article; IM

The aging population is susceptible to developing dry mouth (xerostomia). Elderly patients present all of the major risk factors to acquiring dry mouth which include systemic diseases and disorders, such as diabetes and depression, and the use of numerous medications, including anti-hypertensives and anti-depressants. The consequences of untreated dry mouth are severe limitations of masticatory function and speech, and increased risk of developing caries, periodontal diseases and fungal infections. Assessment of xerostomia, which includes a set of signs and symptoms that impact on the individual, can only be fully explored through a thorough medical history, intra-oral examination and recording the subjective views of patients. This study suggests a methodology for the assessment of xerostomia through a xerostomia questionnaire, which was used to evaluate the effectiveness and acceptability of a saliva substitute product (Biotene) in the treatment of xerostomia in 20 elderly patients exhibiting both severe and moderate symptoms. Wilcoxon signed-ranked tests revealed significant improvements in the number and severity of symptoms between the pre-test and the post-test groups. Biotene products were also found to be effective in the treatment of both severe and moderate symptoms of xerostomia. Biotene saliva substitutes are an acceptable and effective method of treatment for elderly people suffering from dry mouth.

REF ID: 3057

Level IV: Non-experimental study

Topic 1: Risks

Matear, D. W., Locker, D., Stephens, M., & Lawrence, H. P. (2006). Associations between xerostomia and health status indicators in the elderly. *Journal of the Royal Society for the Promotion of Health, 126(2), 79-85.*

Journal Article, Research, Tables/Charts

Aims: This study investigated the associations between xerostomia (dry mouth) (low, moderate and high) with other categorical variables (e.g. demographic and health status indicators). This paper aims to report on the severity of xerostomia in the elderly population and investigate the relationship with other aspects of perceived health. Method: Data were obtained from a cross-sectional survey of 225 elderly people from a large multilevel geriatric care centre. The centre consists of three levels of care: an apartment building in which residents live more or less independently, a home for the aged, and a chronic care hospital. Participants in the study were recruited when they attended the dental care facility. Data were collected by means of a

personal interview conducted either at the dental care facility or the participant's residence. Results: The mean age was 83 years. Most were females (72%) and almost all (99%) reported one or more chronic medical conditions; 88% had physical disabilities. Xerostomia was recorded on a seven-point scale. Scores were categorised as low, medium or high and the proportions were 49.3%, 30.3% and 20.4% respectively. Bivariate analysis showed no association between dry mouth and sex, age, general health change or life satisfaction. However, when the high xerostomia group was separated out and odds ratios calculated they were 2.3 to 4.9 times more likely to experience a negative impact on health than the low group. Xerostomia did not have a significant impact on chewing capacity, morale or stress, although it contributed to the variability of the oral health-related quality of life measures. It was the only variable with a significant effect (OR 2.55) for the Oral Health Impact Profile-14 and displayed a higher odds ratio (2.76) for the Geriatric Oral Health Assessment Index. Selfreported xerostomia in the elderly population can be categorised into a severity scale. Those suffering most from xerostomia are more likely to experience a negative impact on general health. Conclusion: The key finding in this study is that xerostomia has a significant and negative impact on the quality of life of elderly individuals, though oral function may be less affected.

REF ID: 3242

Level IV: Non-experimental study

Topic 3: Assessment

Maupome, G., Wyatt, C. C., Williams, P. M., Aickin, M., & Gullion, C. M. (2002). Oral disorders in institution-dwelling elderly adults: A graphic representation. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 22(5), 194-200.

Journal Article; Multicenter Study; D

This study was conducted to assess the oral health status and dental care needs of elderly adults living in long-term care facilities. Dentists examined 601 elderly adults, living in one of six extended-or intermediate-care facilities, between September 1999 and May 2000. Data from 532 of the subjects were analyzed with descriptive statistics and zero-order inverse polynomials. Using a computer program, the authors compiled summaries of oral health data on individuals and institutional levels. This study suggests that there are numerous unmet dental needs among elderly adults who live in institutions. The CODE index used to assess the oral health of these residents offers a systematic portrayal of oral disorders in terms of severity. As the authors demonstrated, this index can be readily analyzed using zero-order inverse polynomials to summarize collected data into a graphic description, which can be helpful in managing and administrating oral health care interventions in long-term care facilities.

REF ID: 3074

Level IV: Non-experimental study

Topic 3: Assessment

McGrath, C., & Bedi, R. (2004). Why are we 'weighting': An assessment of a self-weighting approach to measuring oral health-related quality of life. *Community Dentistry and Oral Epidemiology*, 32(1), 19-24.

Journal Article, Research, Tables/Charts

OBJECTIVE: To determine whether or not self-weighting at an item level contributes to the performance of an oral health-related quality-of-life measure. **DESIGN:** Data were collected in two national surveys conducted a month apart, one using the "weighted" measure and the other an "unweighted" version of the UK oral health-related quality-of-life measure. In addition, sociodemographic and self-reported oral health status were recorded. **RESULTS:** The UK oral health-related quality-of-life measure discriminated between groups based on age group (<65, 65 and older) and social class (higher and lower) irrespective of the version of the questionnaire used. Both versions also showed significant associations with self-reported oral health: denture status ($P < 0.01$) and number of teeth possessed ($P < 0.01$). In addition, both versions demonstrated predictive ability in identifying those in prosthetic need (<20 teeth and without recourse to a denture, $P < 0.01$). **CONCLUSION:** Weighting the UK oral health-related quality-of-life instrument does not improve the psychometric properties of the instrument and thus raises questions about the value of self-weighting at an item level.

REF ID: 3069

Level IV: Non-experimental study

Topic 3: Assessment

McMillan, A. S., Leung, K. C. M., Pow, E. H. N., Wong, M. C. M., Li, L. S. W., & Allen, P. F. (2005). Oral health-related quality of life of stroke survivors on discharge from hospital after rehabilitation. *Journal of Oral Rehabilitation*, 32(7), 495-503.

Journal Article, Research, Tables/Charts

The study aimed to investigate oral health-related quality of life (OHR-QoL) of stroke survivors on hospital discharge after rehabilitation. It was a cross-sectional study involving 43 elderly survivors of mild to moderate stroke about to be discharged from hospital after rehabilitation and a comparison group of 43 community-dwelling elderly people. The Medical Outcomes Short Form 36 (SF-36) measure, the General Oral Health Assessment Index (GOHAI) and an oral health transition scale were administered prior to a dental examination. Median SF-36 subscale scores were significantly different between groups (P 0.05). Health-related quality of life in general was significantly poorer after stroke although patients were considered physically well enough to be discharged from hospital. There was some impairment of OHR-QoL. The nature of the stroke, the hospital environment including diet, coping strategies and elderly Chinese peoples' perception of health should be taken into account when interpreting measures of health status in stroke survivors.

REF ID: 3161

Level V: Literature review

Topic 1: Risks

Meurman, J. H., & Hamalainen, P. (2006). Oral health and morbidity--implications of oral infections on the elderly. *Gerodontology*, 23(1), 3-16.

Journal Article; Review; D

Detrimental effects of oral infections on general health have been known for almost 3000 years. Modern studies, however, have cast new light on the pathogenic mechanisms by which oral infections appear to link with morbidity and mortality. In particular, among the elderly, poor dental health seems to associate with all-cause mortality. This review aims to provide an overview of present knowledge of these issues, starting from dental bacteraemia, oral mucosal infections and problems of drug resistance and, briefly, discussing what is known about the link between oral health and some systemic diseases such as atherosclerosis and type-2 diabetes. The main conclusions are that scientific evidence is still weak on these interactions and that the elderly should be better taken into account when planning future studies. Functions of the body differ in the frail and diseased from those of the young. Consequently, novel prevention and treatment strategies should be developed and properly tested for combating oral infections in elderly populations. Specific suggestions for further research are outlined.

REF ID: 3066

Level IV: Non-experimental study

Topic 3: Assessment

Mignogna, M. D., Fedele, S., Lo Russo, L., & Leuci, S. (2005). The diagnosis of burning mouth syndrome represents a challenge for clinicians. *Journal of Orofacial Pain*, 19(2), 168-173.

Journal Article, Research, Tables/Charts

AIMS: To evaluate the occurrence of professional delay in the diagnosis, referral, and treatment of patients with burning mouth syndrome (BMS). **METHODS:** Fifty-nine patients (51 women and 8 men; average age, 60.5 years; age range, 32 to 88 years) diagnosed with BMS at our institution were retrospectively studied. Data were collected about the onset of oral symptoms, consultations with medical and dental practitioners, and misdiagnosis before definitive BMS diagnosis and treatment. **RESULTS:** The average delay from the onset of the symptoms to definitive diagnosis was 34 months (range, 1 to 348 months; median, 13 months). The average number of medical and dental practitioners consulted by each patient over this period and who initially misdiagnosed BMS was 3.1 (range, 0 to 12; median, 3). Candidiasis and aspecific stomatitis were the most frequent misinterpretations of the symptoms before appropriate referral. In about 30% of cases, no diagnosis of the oral symptoms was made or explanation given. **CONCLUSION:** Professional delay in

diagnosing, referring, and appropriately. managing BMS patients occurred frequently in the group studied. No significant differences were found in the number of medical and dental practitioners who were consulted. Emphasis must therefore be placed upon educational efforts to improve health care providers' awareness of BMS. This should increase the rate of recognition and appropriate referral or treatment of patients with chronic orofacial pain due to BMS.

REF ID: 3260

Level V: Literature review

Topic 1: Risks

Mojon, P. (2002). Oral health and respiratory infection. *Journal of the Canadian Dental Association*, 68(6), 340-345.

Journal Article; Review; D; IM

The oral cavity has long been considered a potential reservoir for respiratory pathogens. The mechanisms of infection could be aspiration into the lung of oral pathogens capable of causing pneumonia, colonization of dental plaque by respiratory pathogens followed by aspiration, or facilitation by periodontal pathogens of colonization of the upper airway by pulmonary pathogens. Several anaerobic bacteria from the periodontal pocket have been isolated from infected lungs. In elderly patients living in chronic care facilities, the colonization of dental plaque by pulmonary pathogens is frequent. Notably, the overreaction of the inflammatory process that leads to destruction of connective tissue is present in both periodontal disease and emphysema. This overreaction may explain the association between periodontal disease and chronic obstructive pulmonary disease, the fourth leading cause of death in the United States. These findings underline the necessity for improving oral hygiene among patients who are at risk and those living in long-term care institutions.

REF ID: 3155

Level IV: Non-experimental study

Topic 3: Assessment

Montal, S., Tramini, P., Triay, J. A., & Valcarcel, J. (2006). Oral hygiene and the need for treatment of the dependent institutionalised elderly. *Gerodontology*, 23(2), 67-72.

Journal Article; D

OBJECTIVE: To assessing the oral hygiene and treatment needs of a geriatric institution in southern France. **BACKGROUND:** For various reasons, the care demand from elderly people is low and difficult to determine, whereas their oral status would need long and complicated treatments. **MATERIALS AND METHODS:** From 2003 to 2004, a cross-sectional study of 321 elderly patients was conducted at several geriatric services of Montpellier, France. The clinical evaluation of dental status was recorded together with medical information. Dental and prosthetic hygiene, status of dentures, caries experience, dependence conditions and treatment needs were evaluated. **RESULTS:** The prevalence of edentulism was 27%, with no gender difference (23% of the men and 29% of the women). Among them, 16.7% (upper jaw) and 18.1% (lower jaw) were totally edentulous with no denture. The mean number of decayed and missing teeth was 3.7 for men and 2.8 for women and 21.5 for men and 21.0 for women, respectively. The mean number of filled teeth was 0.8 for men and 1.3 for women, with no statistical difference according to gender for the three indexes. Most of the subjects needed prostheses (53%), 45.1% extractions and 30.6% conservative treatments. Only 2.4% did not need any treatment. **CONCLUSION:** The prevalence of edentulism was relatively low, while the need for prosthodontic rehabilitation, especially for men, was still very high. The dental hygiene was globally inadequate. This evaluation emphasises the care demand and the need for help in oral hygiene procedures for the dependent institutionalised elderly.

REF ID: 3107

Level IV: Non-experimental study

Topic 1: Risks

Morin, N. M., Dye, B. A., & Hooper, T. I. (2005). Influence of cigarette smoking on the overall perception of dental health among adults aged 20-79 years, united states, 1988-1994. *Public Health Reports*, 120(2), 124-132.

Journal Article, Research, Tables/Charts

OBJECTIVE: Investigation into the relationship between lifestyle factors (particularly cigarette smoking) and perceived oral health has been limited. Data from the third National Health and Nutrition Examination Survey (NHANES II), 1988-1994, were used to explore this relationship in a large sample of U.S. adults.

METHODS: This study used data on 13,357 dentate participants in NHANES III aged 20-79 years. In NHANES III, information on perceived dental health, sociodemographic attributes, smoking status, frequency of dental visits, dental insurance, and general health perception were collected during a home interview, and oral health status was assessed at a mobile examination center. **RESULTS:** Overall, 34.4% of individuals in the study sample reported having an unfavorable perception of their dental health by qualifying it as "fair" or "poor." Furthermore, 46.6% of smokers had an unfavorable dental health perception, compared to 28.3% of non-smokers. An interaction between smoking and race/ethnicity was found in logistic regression modeling. Stratified results show that cigarette smoking was not a significant predictor for an unfavorable dental health perception among individuals who self-identified as Mexican American, but smoking was a significant predictor for an unfavorable dental health perception among those who identified as non-Hispanic black or non-Hispanic white. **CONCLUSIONS:** This is the first study to describe the effects of smoking on dental health perception while controlling for examined oral health status. Because perceived dental health is a potential indicator for dental care utilization, a better knowledge of the factors that influence dental health perception is not only important for dental services planning, but also for understanding oral health-related quality of life issues. Additionally, given that smoking may negatively affect dental health perception, these findings have potential implications for smoking cessation activities conducted by dental care providers.

REF ID: 3182

Level V: Literature review

Topic 1: Risks

Mulligan, R., & Sobel, S. (2005). Osteoporosis: Diagnostic testing, interpretation, and correlations with oral health--implications for dentistry. *Dental Clinics of North America*, 49(2), 463-484.

Journal Article; Review; IM

Osteoporosis affects over 10 million Americans, including over 2 million men. Dentistry is in a position to work alongside medicine to assist the population in preventing and coping with this condition. This article provides an overview of osteoporosis, including its causes, assessment, prevention, and treatment. Various pharmacologic agents are reviewed, including bisphosphonates, selective estrogen receptor modulators, calcitonin, anabolic agents, and fluoride. The article also discusses the dentist's role in prevention, risk assessment, diagnosis, nutrition counseling, and evaluating the impact of the disease and its treatment on dental management and treatment planning. As dental implants become more in demand, the prognosis for and potential complications of implant therapy in patients with osteoporosis are a matter of intense interest.

REF ID: 3095

Level IV: Non-experimental study

Topic 3: Assessment

Myers, S. L., Rhodus, N. L., Parsons, H. M., Hodges, J. S., & Kaimal, S. (2002). A retrospective survey of oral lichenoid lesions: Revisiting the diagnostic process for oral lichen planus. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*, 93(6), 676-681.

Journal Article, Research, Tables/Charts

OBJECTIVE: We sought to investigate patient demographics and diagnostic trends in biopsies in patients with final diagnoses of oral lichen planus or lichenoid over 4 decades. **METHODS:** Archived biopsy reports from 248 patients were examined for 1966, 1976, 1986, and 1996. Data were collected for patient age and sex, significant medical and dental history, description of lesion, and clinical and histopathologic diagnoses.

RESULTS: Oral lichen planus made up a declining portion of total final diagnoses over the decades. The number of cases with less-than-definitive diagnoses and using modifying terminology (eg, probable, possible, suggestive of) increased. In addition, the age at diagnosis for female patients increased by 1.2 years per decade on average, whereas the age for male patients decreased by 3.5 years per decade on average.

CONCLUSIONS: The diagnosis of oral lichen planus appears to have been extended by the use of modifying terminology to include lesions that have less than definitive features. Comprehensive clinical histories and investigations can help limit the inclusion of such lesions.

REF ID: 3167

Level II: Individual experimental study

Topic 4.4: Management-Products

Myoken, Y., Yamane, Y., Myoken, Y., & Nishida, T. (2005). Plaque removal with an experimental chewable toothbrush and a control manual toothbrush in a care-dependent elderly population: A pilot study. *The Journal of Clinical Dentistry*, 16(3), 83-86.

Clinical Trial; Journal Article; Randomized Controlled Trial; D

OBJECTIVE: Oral hygiene and oral health are major concerns for care-dependent elderly persons. The objective of this study was to examine the plaque removal efficacy of a novel experimental chewable toothbrush used by the subjects themselves. **METHODOLOGY:** Fourteen subjects whose oral care was usually provided by caregivers in nursing facilities were enrolled in a two-phase, crossover study. The study was designed to evaluate plaque removal following a single brushing with either an experimental chewable toothbrush used by the subjects themselves, or a control manual toothbrush used by caregivers on the subjects. Plaque removal was assessed according to the plaque index of Silness and Loe. **RESULTS:** The overall plaque scores were significantly reduced from 2.14 +/- 0.53 to 1.23 +/- 0.39 using the experimental brush, and from 2.08 +/- 0.43 to 1.22 +/- 0.17 using the control brush ($p < 0.05$). Relative plaque reduction was 41.0 +/- 17.6% for the experimental brush group and 38.8 +/- 16.6% for the control brush group, with no significant difference between the two brushes ($p = 0.84$). On lingual tooth surfaces, the experimental brush showed a plaque reduction of 68.8 +/- 13.7% compared to 38.4 +/- 22.9% with the control brush, and the difference was statistically significant ($p = 0.011$). The chewable toothbrushes were harmless and acceptable to the subjects. **CONCLUSION:** The experimental brush was able to remove a significant amount of plaque, particularly on the lingual surfaces, demonstrating its effectiveness for plaque removal when used by care-dependent elderly.

REF ID: 3189

Level II: Individual experimental study

Topic 4: Management

Nicol, R., Petrina Sweeney, M., McHugh, S., & Bagg, J. (2005). Effectiveness of health care worker training on the oral health of elderly residents of nursing homes. *Community Dentistry and Oral Epidemiology*, 33(2), 115-124.

Clinical Trial; Controlled Clinical Trial; Journal Article; Multicenter Study; D; IM

OBJECTIVES: The aim of this study was to evaluate the effect of a staff training programme on mouth care on the oral health of elderly residents of long-term care institutions. **METHODS:** Seventy-eight residents of five long-stay institutions were enrolled and underwent a baseline oral health assessment. Staff caring for residents in three of the sites received intensive training in mouth care. This comprised lecture and video material complemented by clinical demonstrations. The oral health of residents at all five sites was reassessed at periods of 3 and 9 months. Staff caring for residents in the remaining two institutions were then provided with mouth care training and all patients were reassessed at 18 months. Statistical analyses were undertaken to examine for significant changes in selected oral health parameters after training, within each group. **RESULTS:** Oral mucosal disease and oral dryness were common at baseline. The staff training was well received. Following staff training, there was a significant reduction in the number of residents left to undertake their own oral care. There were significant improvements in denture hygiene and a reduction in the number of residents wearing dentures overnight. The prevalence of oral mucosal disease dropped, with significant reductions in angular cheilitis and denture stomatitis. **CONCLUSION:** This education programme was effective in changing oral health care procedures within long-stay institutions for the elderly, with measurable improvements in oral health of the residents.

REF ID: 3130

Level V: Case report

Topic 1: Risks

Oghalai, J. S. (2002). Aspiration of a dental appliance in a patient with alzheimer disease. *JAMA: Journal of the American Medical Association*, 288(20), 2543-2544.

Journal Article, Case Study, Letter, Research

REF ID: 3077

Level IV: Non-experimental study

Topic 3: Assessment

Ohba, T., Takata, Y., Ansai, T., Morimoto, Y., Tanaka, T., & Kito, S. et al. (2003). Evaluation of calcified carotid artery atheromas detected by panoramic radiograph among 80-year-olds. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*, 96(5), 647-650.

Journal Article, Diagnostic Images, Research

OBJECTIVE: To evaluate the incidence among 80-year-olds of calcified carotid artery atheromas (CCAAs) as detected on panoramic radiographs. The relationship between CCAAs and general and oral health was also evaluated. **STUDY DESIGN:** Six hundred and fifty-nine panoramic radiographs (262 males, 397 females), obtained from 80-year-old residents of Fukuoka Prefecture, Japan, were used for evaluation of CCAAs. **RESULTS:** Of 659 panoramic radiographs, 33 (5%) were noted to have CCAAs. These appeared as a radiopaque nodular mass or masses adjacent to or just below the intervertebral space between C3 and C4. CCAAs were found in 8 males and 25 females. There were marginally significant differences between males and females in CCAAs ($P = 0.06$). Seventy-four percent of CCAAs were detected in the right side. There appeared to be very little relationship between CCAAs and general and oral health. **CONCLUSIONS:** The results of this study gives further support to the idea of using panoramic radiographs to detect CCAAs. Therefore, we feel that panoramic radiographs should be evaluated not only for pathosis of the teeth and jaws, but also for other incidental findings, especially in the soft-tissue region of the neck. The findings from this study provide potentially life-saving information especially for those elderly people who are at risk for stroke.

REF ID: 3234

Level II: Individual experimental study

Topic 2: Prevention

Ohno, T., Uematsu, H., Nozaki, S., & Sugimoto, K. (2003). Improvement of taste sensitivity of the nursed elderly by oral care. *Journal of Medical and Dental Sciences*, 50(1), 101-107.

Clinical Trial; Journal Article; Randomized Controlled Trial; IM

It has been suggested that oral care is essential for improving the quality of life (QOL). The aim of oral care involves not only maintenance of oral health but also enhancement of mastication and appetite by means of improving taste sensitivity. There are, however, few studies that have investigated the effect of oral care on taste sensitivity. In the present study, we focused on tongue brushing among oral care and examined the changes in taste sensitivities by mild tongue brushing in the nursed elderly. Ninety subjects, over 64 years old with ability to communicate, were divided into 2 groups, one was the cared group (subject's tongue was brushed) and the other was the control group (not brushed but rinsed). The thresholds for four primary tastes such as saltiness, sourness, sweetness and bitterness were measured before and after treatments using the whole mouth method. The mean recognition thresholds for salty and sour tastes significantly decreased after tongue brushing in the cared group, while those for all four tastes were not changed after mouth rinsing in the control group. The present result suggests that mild tongue brushing may enhance taste sensitivity of saltiness and sourness in the nursed elderly.

REF ID: 3220

Level IV: Non-experimental study

Topic 1: Risks

Ono, T., Hori, K., Ikebe, K., Nokubi, T., Nago, S., & Kumakura, I. (2003). Factors influencing eating ability of old in-patients in a rehabilitation hospital in japan. *Gerodontology*, 20(1), 24-31.

Clinical Trial; Journal Article; D

OBJECTIVES: This study was designed to determine the factors influencing eating ability of old in-patients in a rehabilitation hospital. **DESIGN:** Cross-sectional investigation. **SETTING:** Forty-six in-patients in the rehabilitation ward of Hashimoto Hospital in Kagawa Prefecture in Japan were investigated using a multidisciplinary approach. **MAIN OUTCOME MEASURES:** Age, gender, state of dentition, muscle activity of lip, cheek and tongue, biting force, salivary flow rate per a minute (SFR), masticatory ability for gummy jelly, swallowing ability, texture of meal, independency of walking (Functional Independence Measure = FIM) and ability to communicate. **RESULTS:** Bivariate analysis for the relationship between surveyed items

and masticatory ability (chi-square test) identified that better masticatory ability for gummy jelly was associated with age (< 85years), gender (male), state of dentition (dentate), SFR (high), activity of lip (good), biting force (high), swallowing ability (good) and activity of communication (high). Among these items, SFR ($p = 0.001$), gender ($p = 0.004$), ability to communicate ($p = 0.005$) and age ($p = 0.012$) were found having an influence on the masticatory ability (logistic regression analysis). On the other hand, age (< 85years), gender (male), SFR (high), activity of lip (good), activity of cheek (good), biting force (high), masticatory ability (good) and swallowing ability (good) had a relationship with normal texture of meal. In regression analysis, only two items, activity of lip ($p = 0.003$) and swallowing ability ($p = 0.024$) emerged as factors on texture of meal. **CONCLUSIONS:** Masticatory ability for gummy jelly was influenced by cognitive function and was excluded from the factors on the state of meal. These results suggested the limitation of evaluation using test food, so dentists should observe eating behaviour of in-patients. In addition, dentists should pay attention to the activity of the lip and swallowing ability as well as dentition and prostheses in the rehabilitation of eating ability. As SFR was the most significant factor on masticatory ability, this emphasizes the necessity of care for dry mouth caused by side effects of multi-medication.

REF ID: 3281

Level II: Individual experimental study

Topic 3: Assessment

Pai, S., Ghezzi, E. M., & Ship, J. A. (2001). Development of a visual analogue scale questionnaire for subjective assessment of salivary dysfunction. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*, 91(3), 311-316.

Clinical Trial; Journal Article; Randomized Controlled Trial; Validation Studies; D; IM

OBJECTIVE: This study's objective was to develop a Visual Analogue Scale (VAS) xerostomia questionnaire and to evaluate the validity and reliability for the clinical diagnosis of salivary gland dysfunction. **Study Design:** Thirty-six healthy adults participated in this double-blind, crossover study. Each subject received an antisialagogue (glycopyrrolate) or placebo. Unstimulated and stimulated parotid and submandibular saliva samples were collected 16 times over a period of 6 hours. An 8-item VAS xerostomia questionnaire was administered after each saliva collection. **RESULTS:** The results demonstrated significant reliability for 7 of the 8 VAS items, whereas validity was significant for unstimulated submandibular saliva. Moving averages were calculated for VAS and salivary flow rate values, and significant correlations were observed between these factors, indicating that changes in VAS responses were predictive of changes in salivary flow. **CONCLUSIONS:** These findings suggest that this VAS xerostomia questionnaire may be helpful in the diagnosis of salivary dysfunction and for detecting changes in salivary flow rate values over time.

REF ID: 3104

Level IV: Non-experimental study

Topic 1: Risks

Paillaud, E., Merlier, I., Dupeyron, C., Scherman, E., Poupon, J., & Bories, P. (2004). Oral candidiasis and nutritional deficiencies in elderly hospitalised patients. *British Journal of Nutrition*, 92(5), 861-867.

Journal Article, Research, Tables/Charts

The prevalence of oral candidiasis and its association with malnutrition in terms of protein-energy malnutrition and mineral and vitamin depletion were evaluated in ninety-seven hospitalised older adults aged 82.1 (SD 8.6) years. Patients underwent a complete oral examination with microbiological investigation on admission to our geriatric rehabilitation unit. Patients were assessed nutritionally by evaluation of dietary intake and measurement of anthropometric variables, serum nutritional proteins, ferritin, Zn, folate, vitamins B12 and C. The prevalence of oral candidiasis was 37% (n 36); the proportion of patients with BMI <20 kg/m² was 32% (n 31). The nutritional status of the population was studied by comparing two groups defined according to the absence (group I; n 61) or presence (group II; n 36) of oral candidiasis. The two groups did not differ on the basis of BMI and mid-arm circumference. However, group II had a smaller leg circumference, lower daily energy and protein intakes, lower albumin and transthyretin levels. Patients successfully treated with fluconazole increased their intake on day 30. The proportion of patients with hypozinaemia (<12.5 micromol/l) and vitamin C deficiency (<0.7 mg/l) was higher in group II. Treatment with antibiotics, poor oral hygiene, denture wearing, and vitamin C deficiency appeared as the most

significant independent risk factors associated with oral candidiasis. The present findings show that oral candidiasis appears to be related to malnutrition and results in mucosal lesions that have a negative impact on energy intake, which may subsequently worsen nutritional status

REF ID: 3141

Level IV: Non-experimental study

Topic 3: Assessment

Pau, A. K. H., & Croucher, R. (2001). Self-reported oral health status and oral-health related behaviours of a sample of chinese elders in inner london, UK: A pilot investigation. *International Journal of Health Promotion and Education*, 39(3), 80-85.

Journal Article, Research, Tables/Charts

Objectives: To describe the self-reported oral health status and oral-health related behaviours of a sample of 54 Chinese elders aged 54 years and over, resident in Inner London. Design: Cross-sectional study, using a structured questionnaire administered by two interviewers in English and Cantonese in three luncheon clubs in Inner London. Results: Subjects who reported poor to fair oral health (33 subjects, 72%) were more likely to report poor to fair overall health rather than good overall health. Seventeen subjects (32%) reported having 20 or more natural teeth; 10 subjects (18%) were edentulous; 31 subjects (57%) wore dentures; 25 subjects (46%) reported having experienced at least two oral conditions in the previous twelve months; 40 subjects (74%) reported brushing their teeth or dentures at least twice a day; 31 subjects (58%) had not visited a dentist in the previous twelve months. Subjects who had visited a dentist in the previous twelve months were more likely to report having language difficulties rather than no difficulties with their use of health services. Conclusions: Self-perceived overall health was found to be associated with self-perceived condition of teeth. Migration and ethnicity may have an impact on dental care utilisation. Although the sample reported a symptom-oriented pattern of dental care utilisation, poor self-perception of oral health and experience of oral conditions do not always lead to dental care utilisation. There is a gap in knowledge on the cause and prevention of periodontal disease. Further research is required to establish the correlation between the clinical measures of overall health and oral health, and between ethnicity and dental care utilisation.

REF ID: 3070

Level IV: Non-experimental study

Topic 1: Risks

Paulander, J., Axelsson, P., & Lindhe, J. (2003). Association between level of education and oral health status in 35-, 50-, 65- and 75-year-olds. *Journal of Clinical Periodontology*, 30(8), 697-704.

Journal Article, Research, Tables/Charts

AIM: The aim of the present study was to evaluate the association between educational level and dental disease, treatment needs and oral hygiene habits. MATERIAL AND METHODS: Randomized samples of 35-, 50-, 65- and 75-year-olds, classified according to the educational level: [low (LE): elementary school or higher (HE)], were identified. In 1091 subjects, a number of characteristics such as (i) number of teeth, (ii) periodontal attachment levels (PAL), (iii) caries and (iv) occlusal function were recorded. Educational level, oral hygiene and dietary habits were self-reported. Non-parametric variables were analyzed by chi², Mann-Whitney U-Wilcoxon's rank sum tests, and parametric variables by Student's t-test (level of significance 95%). A two-way anova was performed on decayed, missing and filled surfaces to investigate the interaction between age and educational level. All statistical procedures were performed in the SPSS statistical package. RESULTS: The number of remaining teeth was similar for LE and HE in the 35-year olds (25.8 versus 26.6), but in the older age groups LE had significantly a larger number of missing teeth. The LE groups (except in 65-year olds) exhibited significantly more PAL loss. LE had significantly fewer healthy gingival units in all but the 75-year age group. In all age groups, LE had fewer intact tooth surfaces and a significantly poorer occlusal function. The frequency of tooth cleaning measures and dietary habits did not differ between LE and HE. CONCLUSION: Educational level was shown to influence the oral conditions and should be considered in assessing risk, and in planning appropriate preventive measures.

REF ID: 3214

Level IV: Non-experimental study

Topic 4: Management

Paulsson, G., Soderfeldt, B., Nederfors, T., & Fridlund, B. (2003). The effect of an oral health education program after three years. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 23(2), 63-69.

Journal Article; D

Three years after providing an oral health education program (OHEP) to nursing personnel, the authors analyzed the effect of the program on knowledge of the importance of oral health and on perception among the nurses of the possibility to implement oral care in patient care. The study was based on a cross-sectional survey of all nursing personnel (N = 2,901) in five municipalities in the Southwestern Sweden, of whom 950 had attended four one-hour lessons during an OHEP in 1996. The response rate to the survey questionnaire was 67% (1,930 subjects). Statistical analysis was performed by means of descriptive and analytical statistics. The program was shown to have an independent effect on the dependent variables "knowledge of oral health" and "assessment of implementation possibilities." This study has given further evidence of the feasibility of an educational program to improve both knowledge and implementation of oral health care.

REF ID: 3063

Level I: Systematic review

Topic 4: Management

Pearson, A., & Chalmers, J. (2004). Oral hygiene care for adults with dementia in residential aged care facilities. *JBI Reports*, 2(3), 65-113.

Journal Article, Research, Systematic Review, Tables/Charts

Objective The objective of this systematic review was to report on the best available evidence relating to oral hygiene for adults with dementia in residential aged care facilities, including: documenting the prevalence and incidence, as well as the experiences and increments, of oral diseases and conditions the use of assessment tools by carers to evaluate oral health oral hygiene care strategies to prevent oral diseases and conditions the provision of dental treatment and the ongoing management of oral diseases and conditions. **Inclusion criteria** This review considered any randomised or non-randomised controlled studies, cohort studies, case-control studies, multiple time series studies, uncontrolled studies, descriptive studies and opinions of respected authorities (including theses and other publications) related to residents with dementia living in residential aged care facilities in Australia and overseas; community-dwelling adults with dementia; and special needs adult populations (for preventive oral hygiene care strategies and interventions). The review considered studies and publications designed to: 1 quantify the oral health status of older adults living in residential aged care facilities; 2 quantify the oral health status of adults with dementia living in the community and in residential aged care facilities; 3 evaluate tools used to assess the oral health of residents by staff and carers working in residential aged care facilities; 4 evaluate preventive oral hygiene care strategies and interventions used in special needs adult populations (including adults with dementia); and 5 evaluate oral health care training and oral hygiene care provision, staff and carers working in residential aged care facilities. **Dental outcome measures of interest** were those relating to the prevalence, incidence, experiences and increments of oral diseases and conditions including: denture problems, coronal and root caries, periodontal diseases (plaque accumulation, gingivitis, loss-of-attachment), oral mucosal conditions, xerostomia and salivary gland hypofunction, tooth loss, difficulty chewing, behavioural problems and pain/discomfort. **Related characteristics and outcomes of interest** included: medical conditions, medications, cognitive status, functional status, nutritional status and sociodemographics. **Search strategy** The aim of the search was to locate relevant English-language studies and publications appearing between 1980 and 2002. The search utilised a two-step approach, involving an initial search of electronic databases using combinations of key words followed by a second extensive search carried out using the identified key words. This was supplemented with a secondary search of the references cited in the identified studies. **Electronic database searched** were: Cinahl, Embase, Psycinfo, Medline and Current Contents. **Methodological quality** All selected studies were critically appraised by two reviewers prior to inclusion in the review. **Results** In regards to relevance, incidence, experiences, and increments of oral diseases and conditions, possible risk factors identified included: saliva dysfunction, polypharmacy, comorbid medical conditions, swallowing and dietary problems, increased functional dependence, need for assistance with oral hygiene care, and poor access and utilisation of dental care.

Evidence on the use of assessment tools by carers to evaluate residents' oral health showed that successful assessment of residents with and without dementia by nursing staff requires appropriate staff training by a dental professional. Coupled with appropriate training, an oral assessment screening tool designed for residents with dementia has been successfully used by nursing and care staff to identify residents requiring further review by dental professionals. Expert opinion in the field indicates that oral assessment screenings by a staff member and then by a dentist would ideally be undertaken upon admission to a facility, and regularly thereafter by staff and/or dentists as required. Clinicians and researchers suggested that oral hygiene care strategies to prevent oral diseases and conditions were found to be effective in preventing oral diseases, and thus are relevant for use in the resident with dementia. In regards to the provision of dental treatment and ongoing management of oral diseases and conditions, the use of adjunctive and preventive aids were found to be effective when introduced in conjunction with a staff training program: Expert opinion suggests that behaviour management techniques will increase the potential of performing oral hygiene care interventions. Conclusions This review suggests that the training of staff in the form of a comprehensive practically oriented program addressing areas such as oral diseases, oral screening assessment, and hands-on demonstration of oral hygiene techniques and products is likely to have a positive impact on the management of oral hygiene care within residential aged care facilities. The review also identified that regular brushing with fluoride toothpaste, use of therapeutic fluoride products and application of therapeutic chlorhexidine gluconate products are validated by research as effective for the general population and some populations with special needs.

REF ID: 3204

Level IV: Non-experimental study

Topic 3: Assessment

Peltola, P., Vehkalahti, M. M., & Wuolijoki-Saaristo, K. (2004). Oral health and treatment needs of the long-term hospitalised elderly. *Gerodontology*, 21(2), 93-99.

Journal Article; D

OBJECTIVES: To determine the oral health and treatment needs of the long-term hospitalised elderly. **SETTING:** The Laakso long-term hospital, Helsinki, Finland. **DESIGN:** A cross-sectional study with clinical oral examinations. **SUBJECTS:** All long-term patients (n = 260) aged 60 and older. **MAIN OUTCOME MEASURES:** Edentulousness, presence and hygiene of dentures, mucosal findings, number of teeth, functioning teeth and tooth remnants, level of dental hygiene, and need for operative treatment. **RESULTS:** Subjects' mean age was 83.3 years (SD = 8.1); 42% were edentulous, 45% of women and 33% of men (p = 0.12). With no gender difference, 41% had removable dentures, but one in four were considered to be in need of repair or replacement. Denture hygiene was good in 19%, moderate in 44%, and poor in 37%, and for men worse than for women (p = 0.02). Stomatitis was found in 25%, and angular cheilitis in 28% of the denture wearers. The dentate subjects had on average 12.4 (SD = 8.6) teeth with a clear difference by age (p = 0.03), but no difference by gender. Dental hygiene was considered poor. Of the dentate subjects, 37% were in need of restorations, 51% of periodontal therapy and 42% of extractions. **CONCLUSIONS:** Oral cleanliness should be improved with regards to dentures and teeth. More attention should be focused on dental care of the long-term hospitalised elderly.

REF ID: 3121

Level IV: Non-experimental study

Topic 3: Assessment

Penner, A., & Timmons, V. (2004). Differences in masculine and feminine perceptions of quality of life and oral health. *Probe*, 38(2), 85-88.

Journal Article, Pictorial, Questionnaire/Scale, Research, Tables/Charts

The relationship between oral health and quality of life has been explored recently in order to ascertain the relevance of one to the other. When looking at seniors' oral health, the question of quality of life becomes more significant due to the special oral health issues seniors face. What has not been explored is the relationship that gender may have to perceptions of quality of life and oral health. This Prince Edward island study surveyed 275 seniors living in independent housing facilities. The survey instrument was the Subjective Oral Health Status Indicators survey, developed by Dr. David Locker of the University of Toronto. This survey tool has been tested for validity and reliability and has been in use for approximately 10 years. The

cross-sectional design of the survey randomly sampled seniors from every geographic region of P.E.I. Survey results showed that four of the eight topics in the survey had a significant difference in gender responses. Males represented 18.2% of the respondents, females 76.4%. While this does not reflect the male-to-female ratio of seniors in the general population, it does reflect the male-to-female ratio within independent housing for seniors in P.E.I. Using a t-test, the gender relationship was identified within four topic areas: ability to chew, other oral symptoms, social impact, and activities of daily living. Correlational analysis identified relationships between all the topics with one or both of the demographic variables-age and number of teeth.

REF ID: 3224

Level IV: Non-experimental study

Topic 3: Assessment

Persson, G. R., Persson, R. E., MacEntee, C. I., Wyatt, C. C., Hollender, L. G., & Kiyak, H. A. (2003). Periodontitis and perceived risk for periodontitis in elders with evidence of depression. *Journal of Clinical Periodontology*, 30(8), 691-696.

Journal Article; D; IM

BACKGROUND: Depression and periodontitis are common conditions in older adults. There is some evidence that these two conditions may be related. **AIMS:** To study a population of dentate elders and assess the prevalence of depression, self-assessment of risk for periodontitis and tooth loss, in relation to periodontal disease status. **MATERIAL AND METHODS:** Data were obtained from 701 older subjects (mean age 67.2 years (SD+/-4.6), of whom 59.5% were women. Self-reports of a diagnosis of depression, scores of the Geriatric Depression Scale (GDS), and self-assessment of risk for future tooth loss and periodontitis were compared with a diagnosis of periodontitis based on probing depth, and bone loss assessed from panoramic radiographs. Other systemic diseases and smoking habits were also determined and studied in relation to depression. **RESULTS:** A history of depression was reported by 20% of the subjects. GDS scores ≥ 8 were reported by 9.8% of the elders. Periodontitis was identified in 48.5% of the subjects. Depression was associated with heart attack ($p < 0.05$), stroke ($p < 0.01$), high blood pressure ($p < 0.02$), all combined cardiovascular diseases ($p < 0.001$), chronic pain ($p < 0.01$), osteoarthritis ($p < 0.001$), and osteoporosis ($p < 0.001$) but not with periodontitis ($p = 0.73$). Subjects with depression had a higher self-reported risk score for future tooth loss ($p < 0.02$). No group difference emerged for self-perceived risk for periodontitis. Logistic regression analysis demonstrated that a past history of tooth loss ($p < 0.001$), self-perceived risk for periodontitis ($p < 0.02$), the number of years with a smoking habit ($p < 0.02$), and male gender ($p < 0.02$) were associated with a diagnosis of periodontitis but neither measure of depression could be included in an explanatory model for periodontitis. **CONCLUSIONS:** Evidence of depression (self-report or by GDS) is not associated with risk for periodontitis in older subjects but is associated with tooth loss and chronic conditions associated with pain.

REF ID: 3185

Level V: Literature review

Topic 1: Risks

Persson, R. E., & Persson, G. R. (2005). The elderly at risk for periodontitis and systemic diseases. *Dental Clinics of North America*, 49(2), 279-292.

Journal Article; Review; IM

The increasing population of older subjects with dental care needs will become a major challenge to our society and its care providers. To manage the health care needs of the elderly, a coordination between medical and dental care providers will become necessary. From the dental perspective, it is important to develop skills in the risk assessment of older patients. Such risk assessment of older subjects should take an approach that is holistic and focused on the reduction of the infectious burden and the improvement of self-efficacy.

REF ID: 3180

Level II: Individual experimental study

Topic 4.2: Management-behavior therapy

Philippot, P., Lenoir, N., D'Hoore, W., & Bercy, P. (2005). Improving patients' compliance with the treatment of periodontitis: A controlled study of behavioural intervention. *Journal of Clinical Periodontology*, 32(6), 653-658.

Clinical Trial; Journal Article; Randomized Controlled Trial; D; IM

OBJECTIVES: This clinical trial study investigates whether a behavioural educational intervention based on the autoregulation theory can improve periodontitis patients' compliance with proper dental care at a 1-month follow-up. **MATERIAL AND METHODS:** Thirty patients matched for gender (20 men), age (mean age=39 years) and education were randomly assigned to a control or an experimental treatment condition. In the control condition, patients received the regular treatment based on instruction of the proper prophylactic dental care. In the experimental treatment condition, patients received information about the symptoms of periodontitis, the causes, consequences and temporal course, and the types of effective strategy and they were requested to keep daily records of the effects of applying prophylactic dental care on their periodontitis symptoms. In both groups, plaque indices (PIs) (Silness & Loe 1964) were measured prior to treatment and at a 1-month follow-up. A self-report questionnaire also assessed the representation of periodontitis in all patients. **RESULTS:** A 2 (time of measurement: baseline versus follow-up) x 3 (PI localization) x 2 (experimental group) mixed-design anova computed on the PI reports a large effect of time, $F(1, 28)=267.10$, $p<0.000$, indicating that both groups improved from baseline (mean=1.73, SD=0.08) to the 1-month follow-up (mean=0.56, SD=0.06). It is important to point out that this analysis also revealed the expected Group x Time interaction, $F(1, 28)=7.09$, $p<0.02$, partial $\eta^2=0.19$, indicating that smaller PI were observed in the experimental group (mean=0.24, SD=0.14) than in the control group (mean=0.88, SD=0.38) at follow-up. Post hoc analyses showed that this pattern applies to the proximal and lingual PI but not to the vestibular PI. **CONCLUSIONS:** The present data show that the behavioural education intervention is (a) more effective than a classical intervention based on information and training about prophylactic techniques and (b) that it is effective in bringing most patients to normal levels of PI. For clinical practice, it suggests that better results can be obtained if (a) patients are taught a correct representation about periodontitis and (b) patients' sense of self-efficacy is developed through their own direct experience, by observing the effects of their behaviour on periodontitis symptoms.

REF ID: 3160

Level V: Literature review

Topic 3: Assessment

Pino, A., Moser, M., & Nathe, C. (2003). Status of oral healthcare in long-term care facilities. *Int.J.Dent.Hyg., 1(3), 169-173.*

Journal Article; Review; IM

Oral health is a fundamental component in the overall well-being and quality of life for elders living in long-term care facilities. Effective oral care interventions must not only involve recognising the importance of oral health in this population, but giving oral hygiene the same priority as other care practices in long-term care settings.

REF ID: 3268

Level oral hygiene care for functionally dependent

Topic 1: Risks

Pitiphat, W., Diehl, S. R., Laskaris, G., Cartos, V., Douglass, C. W., & Zavras, A. I. (2002). Factors associated with delay in the diagnosis of oral cancer. *Journal of Dental Research, 81(3), 192-197.*

Journal Article; Multicenter Study; D; IM

Early detection and treatment improve the prognosis for oral cancer. Delays from the onset of symptoms to clinical diagnosis are common. Our aim is to identify factors associated with this delay. Between 1995 and 1998, we interviewed 105 consecutive patients with histologically confirmed oral cancer in Greece. If 21 or more days elapsed from the time the patient noticed major symptoms to a definitive diagnosis, we called it a delay (52% of cases). We used logistic and linear regression to estimate odds ratios of delayed diagnosis and to identify correlates of length of delay, respectively. Former smokers had a 4.3 times greater risk of delayed diagnosis compared with current smokers (95% confidence interval: 1.1-17.1). The length of delay was greater among single patients, non-smokers, or those with stage IV tumors. Clinicians should be advised that delay in the diagnosis of oral cancer occurs frequently, even in individuals who do not smoke heavily.

REF ID: 3118

Level IV: Non-experimental study

Topic 3: Assessment

Powe, B. D., & Finnie, R. (2004). Knowledge of oral cancer risk factors among african americans: Do nurses have a role? *Oncology Nursing Forum*, 31(4), 785-791.

Journal Article, Research, Tables/Charts

PURPOSE/OBJECTIVES: To assess the knowledge of oral cancer risk factors among African Americans.

DESIGN: Descriptive; guided by the Patient/Provider/System Theoretical Model for cancer screening.

SETTING: Community-based primary care center in a southern state. **SAMPLE:** 141 African Americans. The majority was female, had a 12th grade education, and had an income less than 10,000 dollars; 25% were smokers.

METHODS: Participants were asked to identify whether each of 15 factors (i.e., seven risk factors and eight nonrisk factors) increased risk for oral cancer. One point was added for each correct response; therefore, scores could range from 0-15 points. Demographic data were collected.

MAIN RESEARCH VARIABLES: Knowledge of and misconceptions about oral cancer.

FINDINGS: Only six participants correctly identified all of the risk factors. The majority recognized tobacco but was not as aware of the effects of the sun, alcohol, and diet. Many erroneously identified factors such as hot beverages, poor oral hygiene, spicy foods, dentures, and mouthwash as risk factors. Those with higher incomes and those who visited their dentists in the prior year had more knowledge of risk factors. No differences were found in knowledge based on age, gender, education, or smoking status. **CONCLUSIONS:** Some patients are less likely to routinely visit a dentist and are less knowledgeable about the risk factors for oral cancer. Many of these risk factors are modifiable; therefore, patients need to be aware of the risks and have access to effective strategies to reduce risk. **IMPLICATIONS FOR NURSING:** Assess risk factors, teach risk reduction, and correct misinformation. Refer patients to dental professionals. Develop community outreach to African American men at barbershops and fraternal organizations.

REF ID: 3154

Level IV: Non-experimental study

Topic 3: Assessment

Reed, R., Broder, H. L., Jenkins, G., Spivack, E., & Janal, M. N. (2006). Oral health promotion among older persons and their care providers in a nursing home facility. *Gerodontology*, 23(2), 73-78.

Journal Article; D

OBJECTIVES: To assess oral health status and oral health-related quality of life (OHRQoL) of residents in an extended care facility and to assess the care providers' oral health attitudes and knowledge. **METHODS:**

Participants included 137 residents (58.1% female, age range 32-94 years, 91% African-American) and 22 care providers. Residents received an oral examination and completed the Oral Health Impact Profile (OHIP-14), an OHRQoL questionnaire. Care providers completed an oral health knowledge (OHK) questionnaire before and after the on-site geriatric oral health education and training programme. **RESULTS:** Oral examinations showed that 58% of the residents had extensive oral health needs. On the OHIP-14, the mean severity was 9.2 (SD=12.0), extent (number of items rated as 'fairly often' or 'often') was 1.2 (SD=2.6) and prevalence (participants rating at least one item at least 'fairly often') was 37.8%. Most prevalent negative impact items were about 'oral pain', 'appearance' and 'self-consciousness'. Regarding OHK, caregivers' knowledge improved following instruction from 65% correct on the pre-test to 90% correct on the post-test (p<0.05). Subsequent to the eight in-service workshops, providers reported that physical limitations, fear of getting bitten and time constraints were barriers to providing oral hygiene to their residents. **CONCLUSION:** Examination data showed a high level of dental needs among the majority of residents, accompanied by significantly reduced OHRQoL. Although care providers' OHK improved following the geriatric service programme, they reported specific barriers regarding their provision of oral hygiene care to the residents.

REF ID: 3156

Level V: Literature review

Topic 3: Assessment

Rejnefelt, I., Andersson, P., & Renvert, S. (2006). Oral health status in individuals with dementia living in special facilities. *Int.J.Dent.Hyg.*, 4(2), 67-71.

Journal Article; Review; IM

AIM: The aim of this review was to retrieve data describing the oral health status of individuals with dementia

living in special facilities. **MATERIALS AND METHODS:** A literature search on the MEDLINE database (Entrez PubMed) was performed. The literature search yielded 208 papers, of which seven publications were selected for evaluation. **Results:** From the available studies poorer oral hygiene, decreased saliva flow rates and a higher caries incidence were reported in individuals with dementia living in special facilities when compared with healthy individuals. Oral health problems were more pronounced in the severe stage of the disease. **CONCLUSIONS:** There is limited scientific data describing the oral health status of individuals with dementia living in special facilities. However, available data indicate that individuals with dementia living in special facilities have more oral health problems than individuals without dementia.

REF ID: 3127

Level IV: Non-experimental study

Topic 4: Management

Reznick, S., & Matear, D. W. (2002). Perceptions of caregivers regarding the importance of dental care for institutionalized seniors: A pilot study. *Journal of the Royal Society for the Promotion of Health, 122(3), 170-174.*

Journal Article, Research, Tables/Charts

The type of dental treatment that institutionalised elderly receive often depends on the decisions made by various stakeholders. These decisions may be based on a perceived need for treatment. This study was designed to investigate the perception of primary caregivers as to the relative importance of dental care for institutionalised seniors. Seniors who lived in a long-term care institution, with a dental facility available to them on a daily basis, volunteered information regarding their primary caregivers. A total of 25 primary caregivers participated in a structured telephone interview. All (100%) of the caregivers considered emergency dental services and treatment to relieve pain as essential/important services which should be available to institutionalised seniors. The following were most commonly ranked in the top three by the primary caregivers: emergency dental services (57%); dental services to relieve pain (48%); cleanings to prevent mouth disease (45%); check-ups including X-rays (45%); dentures to replace missing teeth (33%); and fillings (24%). The findings of this study suggest that more effort should be directed at investigating the perceived need of value of dental services for institutionalised seniors within the various stakeholders.

REF ID: 3247

Level V: Literature review

Topic 1: Risks

Rice, P. J., & Hamburger, J. (2002). Oral lichenoid drug eruptions: Their recognition and management. *Dental Update, 29(9), 442-447.*

Journal Article; Review; D

Lichen planus is a relatively common, often clinically distinctive, mucocutaneous condition with an uncertain aetiology. One variant of lichen planus is the so-called 'lichenoid drug eruption'. In contrast to idiopathic lichen planus, lichenoid drug eruptions, where practicable, may be managed by substitution of the offending drug. The dental clinician is in a prime position to identify these lesions and liaise with medical colleagues regarding their management. This article reviews oral lichenoid drug eruptions, emphasizing those aspects of relevance to the general dental practitioner.

REF ID: 3240

Level V: Literature review

Topic 1: Risks

Ritchie, C. S. (2002). Oral health, taste, and olfaction. *Clinics in Geriatric Medicine, 18(4), 709-717.*

Journal Article; Review; IM

Oral health, taste, and smell are critical components to an older person's overall sense of well-being and quality of life. Oral health problems can cause pain and discomfort and can hinder the maintenance of a satisfying and nutritious diet. Loss of taste and smell interferes with pleasure derived from food and food-related activities. Attention should be given to preserving teeth and optimizing oral function. Likewise, close evaluation of older adults' medications may identify the causes of taste and smell disorders. In instances in which nutrient intake is inadequate and chemosensory perception is considered a likely contributor, a trial of flavor enhancers or monosodium glutamate may improve both quality and quantity of intake. Much more

information is needed to understand the interrelationship between chemosensory perception, food intake regulatory mechanisms, and nutritional status. Multidisciplinary studies will be required to understand how to improve nutrition through manipulation of oral characteristics, taste, and smell.

REF ID: 3059

QM: Quality Measures

Topic 5: Evaluation/follow-up

Rivett, D. (2006). Compliance with best practice in oral health: Implementing evidence in residential aged care. *International Journal of Evidence-Based Healthcare*, 4(1), 62-67.

Journal Article, Research, Tables/Charts

REF ID: 3082

Level IV: Non-experimental study

Topic 3: Assessment

Robinson, P. G., Gibson, B., Khan, F. A., & Birnbaum, W. (2003). Validity of two oral health-related quality of life measures. *Community Dentistry and Oral Epidemiology*, 31(2), 90-99.

Journal Article, Research, Tables/Charts

OBJECTIVES: To assess the validity of the Oral Impacts on Daily Performance (OIDP) and the short form of the Oral Health Impact Profile (OHIP 14) in the UK. **SETTING:** Primary care department at a UK dental hospital. **SAMPLE:** Consecutive patients. **METHOD:** Cross-sectional comparison of impacts using OIDP and OHIP 14 against clinical findings, Global Oral Health Ratings and pain. **RESULTS:** A total of 179 patients participated (83.2% response rate). OIDP had weak face validity because it contained contingency questions. Both instruments were developed from the same theoretical model and appeared to have reasonable content validity. In regression analyses, the number of impacts detected by each measure and the total score using OHIP 14 were related to the presence of oral disease and inversely related to age. No suitable transformation could be found to allow regression analysis of OIDP total scores. OHIP 14 correlated more closely with Global Oral Health Ratings but both measures correlated similarly to the experience of pain ($0.43 < r < 0.47$). The correlation between OHIP and OIDP scores was +0.78. The use of a simple additive method for calculating the total OHIP 14 score did not compromise its validity. **CONCLUSION:** Both instruments have some validity as measures of Oral Health-Related Quality of Life (OHRQoL) among dental hospital patients. The superior face, criterion and convergent validity and greater amenability to analysis of OHIP 14 render it more suitable for questionnaire-based research and for comparing groups. The additive method may be used to calculate the total score for OHIP 14.

REF ID: 3223

Level V: Literature review

Topic 4: Management

Scala, A., Checchi, L., Montecvecchi, M., Marini, I., & Giamberardino, M. A. (2003). Update on burning mouth syndrome: Overview and patient management. *Critical Reviews in Oral Biology and Medicine : An Official Publication of the American Association of Oral Biologists*, 14(4), 275-291.

Journal Article; Review; D; IM

Burning Mouth Syndrome (BMS) is a chronic pain syndrome that mainly affects middle-aged/old women with hormonal changes or psychological disorders. This condition is probably of multifactorial origin, often idiopathic, and its etiopathogenesis remains largely enigmatic. The present paper discusses several aspects of BMS, updates current knowledge, and provides guidelines for patient management. There is no consensus on the diagnosis and classification of BMS. The etiopathogenesis seems to be complex and in a large number of patients probably involves interactions among local, systemic, and/or psychogenic factors. In the remaining cases, new interesting associations have recently emerged between BMS and either peripheral nerve damage or dopaminergic system disorders, emphasizing the neuropathic background in BMS. Based on these recent data, we have introduced the concepts of "primary" (idiopathic) and "secondary" (resulting from identified precipitating factors) BMS, since this allows for a more systematic approach to patient management. The latter starts with a differential diagnosis based on the exclusion of both other orofacial chronic pain conditions and painful oral diseases exhibiting muco-sal lesions. However, the occurrence of overlapping/overwhelming oral mucosal pathologies, such as infections, may cause difficulties in the diagnosis ("complicated BMS").

BMS treatment is still unsatisfactory, and there is no definitive cure. As a result, a multidisciplinary approach is required to bring the condition under better control. Importantly, BMS patients should be offered regular follow-up during the symptomatic periods and psychological support for alleviating the psychogenic component of the pain. More research is necessary to confirm the association between BMS and systemic disorders, as well as to investigate possible pathogenic mechanisms involving potential nerve damage. If this goal is to be achieved, a uniform definition of BMS and strict criteria for its classification are mandatory.

REF ID: 3280

Level V: Literature review

Topic 1: Risks

Scully Cbe, C., & Shotts, R. (2001). The mouth in neurological disorders. *The Practitioner*, 245(1623), 539, 542-6, 548-9.

Journal Article; Review; IM

REF ID: 3245

Level VI: Opinion

Topic 4: Management

Shapira, E. Z. (2001). Geriatric hygiene: It's not all black and white. *Dentistry Today*, 20(3), 54-59.

Journal Article; D

REF ID: 3140

Level IV: Non-experimental study

Topic 1: Risks

Sheiham, A., & Steele, J. (2001). Does the condition of the mouth and teeth affect the ability to eat certain foods, nutrient and dietary intake and nutritional status amongst older people? *Public Health Nutrition*, 4(3), 797-803.

Journal Article, Research, Tables/Charts

REF ID: 3282

Level V: Literature review

Topic 4: Management

Shenkin, J. D., & Baum, B. J. (2001). Oral health and the role of the geriatrician. *Journal of the American Geriatrics Society*, 49(2), 229-230.

Editorial; Review; IM

REF ID: 3265

Level V: Literature review

Topic 3: Assessment

Shepherd, A. (2002). The impact of oral health on nutritional status. *Nursing Standard (Royal College of Nursing (Great Britain) : 1987)*, 16(27), 37-38.

Journal Article; Review; N

In this article, the author argues that the assessment of oral health in older people is important as it can indicate signs and symptoms of oral and systemic disease.

REF ID: 3078

Level IV: Non-experimental study

Topic 1: Risks

Shimazaki, Y., Soh, I., Koga, T., Miyazaki, H., & Takehara, T. (2003). Risk factors for tooth loss in the institutionalised elderly; a six-year cohort study. *Community Dental Health*, 20(2), 123-127.

Journal Article, Research, Tables/Charts

OBJECTIVE: The aim of this study was to examine risk factors for tooth loss and edentulism in institutionalised elderly people. DESIGN: Six-year prospective cohort study. SETTING: Twenty nine of the 30 institutions for elderly people in Kitakyushu, Japan. SUBJECTS: Four hundred and eighteen of the 1,096 subjects who were dentate at the baseline examination. OUTCOME MEASURES: Factors that influenced tooth loss and edentulism. RESULTS: In both sexes, older subjects had fewer remaining teeth at baseline. Males lost more teeth than females, and edentulism was also more likely in males than in females. Stepwise multiple linear regression analysis showed that the number of teeth, number of decayed teeth, periodontal

pocket depth, and plaque index were significant predictors for the number of teeth lost. The incidence of edentulism was higher in males than in females. Stepwise multiple logistic regression analysis revealed that poorer mental health status, fewer teeth, having deep periodontal pocket, and poorer oral hygiene status were independently associated with the six-year incidence of edentulism. **CONCLUSIONS:** Tooth loss in institutionalised elderly people in Japan is related to both poor oral health status and poor mental health status.

REF ID: 3256

Level V: Literature review

Topic 4: Management

Ship, J. A. (2002). Improving oral health in older people. *Journal of the American Geriatrics Society*, 50(8), 1454-1455.

Comment; Editorial; Review; IM

None

REF ID: 3086

Level IV: Non-experimental study

Topic 3: Assessment

Simons, D., Brailsford, S., Kidd, E. A. M., & Beighton, D. (2001). Relationship between oral hygiene practices and oral status in dentate elderly people living in residential homes. *Community Dentistry and Oral Epidemiology*, 29(6), 464-470.

Journal Article, Research, Tables/Charts

OBJECTIVES: To investigate the relationship between the oral hygiene practices of dentate elderly people living in residential homes, their requests for assistance and their oral health status. **METHODS:** 164 people (81.2+/-7.4 years) participated in an interview and oral examination, and provided a stimulated saliva sample. **RESULTS:** The mean number of coronal decayed surfaces (CDS) was 2.4+/-5.9, stimulated salivary levels (log(10)cfu/ml) of mutans streptococci, lactobacilli and yeasts were 1.6+/-2.1, 3.0+/-2.2, 2.1+/-1.7, respectively, and 53% had root decayed surfaces (RDS). Plaque (PI) and gingival (GI) Indices were 2.3+/-0.7 and 1.6+/-0.4 and denture debris scores (DDS) were high. 31% of the population cleaned their mouths twice daily without requesting help and they had significantly fewer yeasts, RDS, restorations on root surfaces, lower PI, GI (P<0.005) and DDS (P<0.0001) than the 69% who cleaned less often. 50% of those who cleaned less frequently requested assistance with oral hygiene but only 5% said that their carers supported them. Those residents who requested help had significantly higher levels of yeasts, lactobacilli (P<0.001), retained roots, DDS, RDS (P<0.005), PI and GI (P<0.0001). **CONCLUSION:** The elderly residents' perceived need for assistance with oral hygiene was related directly to oral hygiene status and to clinical indicators of mucosal and dental diseases.

REF ID: 3257

Level II: Individual experimental study

Topic 4.3: Management-medication

Simons, D., Brailsford, S. R., Kidd, E. A., & Beighton, D. (2002). The effect of medicated chewing gums on oral health in frail older people: A 1-year clinical trial. *Journal of the American Geriatrics Society*, 50(8), 1348-1353.

Clinical Trial; Journal Article; Randomized Controlled Trial; IM

OBJECTIVES: To determine the effects of a medicated chewing gum on the oral health of frail older people. **DESIGN:** A controlled, double-blind trial using three groups based on random allocation of residential homes. **SETTING:** Sixteen residential homes in West Hertfordshire, England. **PARTICIPANTS:** One hundred eleven dentate subjects aged 60 and older who completed the 12-month study. **INTERVENTION:** Subjects were assigned to a chlorhexidine acetate/xylitol gum (ACHX) group, a xylitol gum (X) group, or a no-gum (N) group. Subjects in the gum groups chewed two pellets for 15 minutes twice daily for 12 months. **MEASUREMENTS:** Primary outcome measures were salivary flow rate, denture debris score, prevalence of angular cheilitis, and denture stomatitis; secondary outcome measures were salivary levels of caries-associated microorganisms. A single examiner, who was blinded to group allocation, made all measurements at baseline before gum usage and at subsequent examinations after 3, 6, 9, and 12 months. Separate analyses were performed for subjects with dentures. **RESULTS:** Subjects in the three groups were similar in most of their

baseline characteristics. The stimulated whole saliva flow rate +/- standard deviation increased significantly for the ACHX (1.4 +/- 0.7 mL/min) and X (1.6 +/- 0.9 mL/min) groups ($P < .01$) over baseline (ACHX = 0.9 +/- 0.6 mL/min, X = 0.8 +/- 0.6 mL/min) and N group levels (0.6 +/- 0.9 mL/min). The levels of mutans streptococci, lactobacilli, and yeasts significantly increased ($P < .05$) in the X and N groups. Denture debris status was significantly lower in the ACHX and X groups than at baseline or in the N group ($P < .01$). The reductions of 91% and 75% in denture stomatitis and angular cheilitis prevalence, respectively, that occurred in the ACHX group were significantly greater ($P < .01$) than the reductions in the X group (denture stomatitis 62%, angular cheilitis 43%). Prevalence of denture stomatitis and angular cheilitis were not significantly changed in the N group. **CONCLUSION:** The use of a medicated chewing gum significantly improved oral health in older occupants of residential homes. Chewing gums should be considered as a potential adjunct to other oral hygiene procedures in older subjects.

REF ID: 3176

Level IV: Non-experimental study

Topic 3: Assessment

Slaughter, A., & Taylor, L. (2005). Perceptions of dental care need among african-american elders: Implications for health promotion. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 25(3), 158-163.

Journal Article; D

The aim of this study was to assess perceived dental care need, actual clinical need and the relationship between these variables and care-seeking behavior among community residing African-American elders. A convenience sample of 146 elders responded to a survey and participated in oral screenings at six senior centers. Elders were categorized as needing routine dental care, some dental care, or urgent dental care. Most (61%) required dental care with one-fourth having urgent dental care needs. Elders reporting a problem tended to seek dental care more often within a year (38%) than those not reporting a problem (27%). Sixty-four percent did not currently have a dental provider. The majority (83%) rated their general health as being fair or good and few (9%) reported oral pain. These findings suggest developing health promotion programs that emphasize non-painful oral signs and symptoms, accompanied by associated general health implications that may compromise overall health.

REF ID: 3183

Level V: Literature review

Topic 3: Assessment

Slaughter, Y. A., & Malamud, D. (2005). Oral diagnostics for the geriatric populations: Current status and future prospects. *Dental Clinics of North America*, 49(2), 445-461.

Journal Article; Review; IM

Because it is a noninvasive technique, there is growing interest in replacing blood with oral-based methods of diagnostics. Oral diagnostics may be used for diagnosis and therapeutic drug monitoring of both oral diseases (eg, caries, periodontal disease, oral lesions, oral cancer) and systemic diseases (eg, infectious diseases, including HIV and AIDS, autoimmune diseases, cancer, and endocrine disorders). The authors address both existing techniques and oral-based diagnostics that will be applicable to the aging population in the future. They also highlight those techniques that are uniquely suited to point-of-care applications.

REF ID: 3206

Level IV: Non-experimental study

Topic 3: Assessment

Soini, H., Routasalo, P., Lauri, S., & Ainamo, A. (2003). Oral and nutritional status in frail elderly. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 23(6), 209-215.

Journal Article; D

This article describes associations between oral health and nutritional status among chronically ill older adults who were living at home and receiving regular professional home care services. A structured questionnaire,

oral examination, and Mini-Nutritional Assessment were completed for 51 subjects (mean age 83.7 years). Two-thirds of the sample were edentulous, and one-third had between 2 and 23 teeth (mean 10.59, SD +/- 6.92). Sixty percent of subjects complained of xerostomia, while dentists found only 48% to have clinical signs of dry mouth. More than half of the subjects had stimulated saliva rates of < 0.8 ml/min. Stimulated saliva secretion rates were lower for persons with no functional natural dentition or prostheses ($p = 0.012$). Subjects assessed their dentures to be more functional than did the dentist (Kappa 0.338). No one was considered malnourished. 47% were at risk of malnutrition, and 52% were well nourished. The dentist's estimation of dry mouth and eating problems were significantly associated to lower MNA scores ($p = 0.049$ and $p = 0.015$, respectively). Subjects with a natural functioning dentition had higher BMI scores ($p = 0.0485$).

REF ID: 3241

Level IV: Non-experimental study

Topic 3: Assessment

Stubbs, C., & Riordan, P. J. (2002). Dental screening of older adults living in residential aged care facilities in perth. *Australian Dental Journal*, 47(4), 321-326.

Journal Article; D; IM

BACKGROUND: This study aimed to estimate the dental treatment needs and oral health status of a sample of older adults in residential aged care facilities in Perth. **METHODS:** The 348 participants (> or = 65 years) were interviewed and screened in 25 facilities. The screenings were carried out by one examiner using a mirror and a portable light. **RESULTS:** Over half (52 per cent) of the participants were edentulous and 45 per cent of those edentulous participants for whom a recording was made ($n=174$) had oral mucosal conditions. The 164 dentate participants had a mean of 12 disease-free standing teeth, a mean decayed, missing or filled teeth (DMFT) of 24.7 (mean DT 0.8, mean FT 5.3) and half of them required the removal of supragingival calculus. Of those with root caries experience ($n=127$), a mean of 1.3 untreated decayed roots and a mean of 1.9 roots covered in plaque were recorded. The majority of the participants (83 per cent) were pensioners eligible for government subsidized dental care and 47 per cent were reported by the Directors of Nursing to have dementia. **CONCLUSIONS:** The data collected here demonstrate poor oral health conditions and a substantial treatment need in a neglected population. More people in nursing homes and hostels are keeping their natural teeth compared with a similar population studied 13 years ago.

REF ID: 3261

Level V: Literature Review

Topic 4: Management

Su, J., Lustbader, E., Solomowitz, B. H., & Dowrich, I. A. (2002). Geriatric dentistry. A review for the general dentist. *The New York State Dental Journal*, 68(3), 25-29.

Journal Article; Review; D; IM

In the 20th century, the oral health of Americans, along with their life expectancy, improved dramatically. The 21st century offers dental professionals the opportunity to help patients maintain their oral health for a lifetime.

REF ID: 3222

Level II: Individual experimental study

Topic 4.4: Management-Products

Sumi, Y., Nakajima, K., Tamura, T., Nagaya, M., & Michiwaki, Y. (2003). Developing an instrument to support oral care in the elderly. *Gerodontology*, 20(1), 3-8.

Clinical Trial; Evaluation Studies; Journal Article; D

BACKGROUND: The dramatic increase in the number of dependent elderly in developed countries has created a great need for their improved oral care. However, optimal oral care by caregivers is not possible because of time constraints, difficulty involved in brushing other individuals' teeth, lack of co-operation, and the lack of perceived need. Therefore, the development of an effective instrument simplifying and supporting oral care to relieve the strain on caregivers is a matter of some urgency. **PURPOSE:** In order to clean the mouths of elderly dependent patients, we have developed a new oral care support instrument (an electric toothbrush in combination with an antibacterial-agent supply and suction system). The purpose of the present

study was to develop and evaluate a new oral care support instrument. METHODS: a) Plaque removal study: The plaque-removing ability of this new instrument in 70 outpatients was compared with the Plak Control D9011 (Braun Gillette Japan Inc.) as a control by means of the Turesky modification of the Quigley and Hein plaque index. b) Clinical study: The subjects were 10 dependent elderly who received oral care using the new oral care support instrument for two weeks. The plaque and gingival indices were used for clinical evaluations. RESULTS: a) Plaque removal study: Brushing with the new oral care support instrument removed significantly more plaque than with the Plak Control D9011. b) Clinical study: The new oral care support instrument allows a more effective removal of dental plaque and shows a significant improvement in the gingival indices in dependent elderly. CONCLUSION: It is concluded that the new oral care support instrument is effective and can be recommended for oral care in the dependent elderly.

REF ID: 3249

Level III: Quasi-experimental study

Topic 4: Management

Sumi, Y., Nakamura, Y., & Michiwaki, Y. (2002). Development of a systematic oral care program for frail elderly persons. *Special Care in Dentistry : Official Publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 22(4), 151-155.

Journal Article; D

The purpose of this study was to develop, implement and evaluate a systematic oral care program for community-dwelling-dependent or institutionalized elderly adults. The study group consisted of 20 dependent elderly adults of which 15 were living in the community and five were in a nursing home. After eight weeks of systematic oral care, the plaque and gingival indices were scored and compared with baseline measurements. Also at the end of the study, caregivers completed a questionnaire that assessed their perspective on the advantages, disadvantages, burden and fatigue in providing the systematic oral care program. The results of this study demonstrate that a systematic oral care program reduced plaque and gingival indices for the subjects as well as reducing the caregivers' burden and fatigue in providing daily oral care.

REF ID: 3073

Level IV: Non-experimental study

Topic 1: Risks

Takano, N., Ando, Y., Yoshihara, A., & Miyazaki, H. (2003). Factors associated with root caries incidence in an elderly population. *Community Dental Health*, 20(4), 217-222.

Journal Article, Research, Tables/Charts

OBJECTIVE: To identify baseline factors associated with future root caries development in an elderly population. BASIC RESEARCH DESIGN: Oral health and general health status examinations were carried out at baseline and after one and two years. In order to identify risk predictors of root caries with a different degree of robustness, three multiple logistic regression analyses where the dependent variables were one, two and three or more disease events were performed. PARTICIPANTS: Six hundred noninstitutionalized adults aged 70 in Niigata, Japan took part in the baseline examination. A total of 373 subjects were followed up for two years and identified as dentate at the two-year examination. RESULTS: During the period of study, 35.9% of subjects developed at least one new root caries lesion. The mean number of new root caries lesions per subject was 0.9 (sd = 1.7). Logistic regression analyses indicated that having one or more root D surface and mean LA \geq 3.6 mm were the most robust risk predictors, having two or more prosthetic crowns, non use of interdental brushes or dental floss and LB \geq 10(5) CFU/ml were moderately robust risk predictors, and a Body Mass Index $<$ 20 was the least robust risk predictor. CONCLUSIONS: These findings suggest that oral health status is a good risk predictor, and poor general health indicated by a low Body Mass Index may also contribute to root caries occurrence in this elderly population.

REF ID: 3112

Level IV: Non-experimental study

Topic 3: Assessment

Takata, Y., Ansai, T., Awano, S., Sonoki, K., Fukuhara, M., & Wakisaka, M. et al. (2004). Activities of

daily living and chewing ability in an 80-year-old population. *Oral Diseases*, 10(6), 365-368.

Journal Article, Research, Tables/Charts

OBJECTIVES: The aim of this study was to determine whether chewing ability or number of intact teeth was related to performance of activities of daily living in 80-year olds. **DESIGN:** This was a cross-sectional survey including dental examinations, chewing self-assessment, and everyday function. **SUBJECTS AND METHODS:** A total of 823 people (309 males, 514 females) who were 80 years of age and resident in the Fukuoka Prefecture, Japan participated in this study. **RESULTS:** The mean number of intact teeth was 7.5 +/- 8.7; of the 15 food items offered, the mean number of foods chewed was 11.2 +/- 3.8. Function was independent in 713 subjects, and dependent in 93. After adjustment for gender, we found the number of foods chewed being linked to independent function by the multiple regression analysis (beta = 0.223, P < 0.0001); the number of intact teeth was only weakly related (beta = 0.077, P = 0.03). By logistic regression analysis, functional dependency was 7.5 times more prevalent in individuals capable of chewing four foods or fewer, and 3.3 times more prevalent in those chewing five to nine, than in those chewing all 15 items. No significant functional difference was related to the number of intact teeth. **CONCLUSION:** Chewing ability may be independently related with functional status in 80-year olds.

REF ID: 3083

Level IV: Non-experimental study

Topic 1: Risks

Takata, Y., Fukuda, J., Kurokawa, H., & Nakanishi, O. (2002). Electrocardiographic findings and history of medical diseases in hospitalised dental patients. *Journal of Disability and Oral Health*, 3(1), 13-19.

Journal Article, Research, Tables/Charts

Aim: To study the prevalence of electrocardiographic (ECG) findings and associated history of medical diseases in hospitalised dental patients. **Design and Subjects:** Medical histories (hypertension, diabetes, hyperlipidaemia, heart disease, stroke), blood pressure (BP), serum cholesterol and glucose concentrations were assessed in relation to ECG findings (ST segment depression, T wave abnormalities, abnormal Q waves, ventricular premature contractions (VPC)) in 1,597 dental patients. **Results:** Patients with a history of heart disease had a higher prevalence of ST depression, T wave abnormalities and VPC. Patients with hypertension had a higher prevalence of T wave abnormalities. Diabetic patients had a higher prevalence of abnormal Q-waves. In patients with a high systolic BP ST depression and T wave abnormalities were found in a higher prevalence. Patients with a high serum cholesterol concentration had a higher prevalence of T-wave abnormalities. **Conclusions:** Histories of heart disease, hypertension, and diabetes are independent predictors of ST depression, T wave changes, or abnormal Q waves. Patients with these factors are at risk of sudden death during dental procedures.

REF ID: 3264

Level II: Individual experimental study

Topic 4.4: Management-Products

Tawse-Smith, A., Duncan, W. J., Payne, A. G., Thomson, W. M., & Wennstrom, J. L. (2002). Relative effectiveness of powered and manual toothbrushes in elderly patients with implant-supported mandibular overdentures. *Journal of Clinical Periodontology*, 29(4), 275-280.

Clinical Trial; Journal Article; Randomized Controlled Trial; D; IM

AIM: The aim of this study was to compare the clinical effectiveness of a powered toothbrush (Braun Oral-B Plaque Remover 3-D) and a manual soft toothbrush (Oral-B Squish-grip brush) for the control of supragingival plaque and soft tissue inflammation around implants supporting mandibular overdentures. **MATERIAL AND METHODS:** The study sample involved 40 edentulous subjects, aged 55-80 years, having 2 unsplinted mandibular implants supporting a complete removable overdenture opposed by a maxillary complete denture. In this single-blinded, randomised, cross-over clinical trial, two 6-week experimental phases were separated by a 2-week wash-out period. 2 weeks prior to each experimental phase (pre-entry visits), implant abutments were polished to remove all plaque and a standardised instruction in the use of the toothbrush was given. Modified plaque and bleeding indices were recorded at the start and end of each experimental period. Mean index scores at each phase were analysed using paired t-test, and the mean number

of sites showing a change in plaque or mucositis were compared using the Mann-Whitney U-test. Combined data from 2 different implant systems were considered after controlling for implant type. RESULTS: Only minor changes in plaque and bleeding scores were observed following the two test periods. There were no statistically significant differences between the manual and powered toothbrushes. CONCLUSION: Manual and powered brushes were found to be of comparable efficacy with regard to improvement in peri-implant bleeding and plaque indices.

REF ID: 3136

Level IV: Non-experimental study

Topic 1: Risks

Terpenning, M. S., Taylor, G. W., Lopatin, D. E., Kerr, C. K., Dominguez, L., & Loesche, W. J. (2001). Aspiration pneumonia: Dental and oral risk factors in an older veteran population. *Journal of the American Geriatrics Society*, 49(5), 557-563.

Journal Article, Research, Tables/Charts

OBJECTIVES: To investigate the importance of medical and dental factors in aspiration pneumonia in an older veteran population. DESIGN: Prospective enrollment of subjects with retrospective analysis of data.

SETTING: Department of Veterans Affairs outpatient clinic, inpatient ward, and nursing home.

PARTICIPANTS: 358 veterans age 55 and older; 50 subjects with aspiration pneumonia.

MEASUREMENTS: Demographic and medical data; functional status; health-related behaviors; dental care utilization; personal oral hygiene; comprehensive dental examination; salivary assays including IgA antibodies; and cultures of saliva, throat, and dental plaques. RESULTS: Two logistic regression models produced estimates of significant risk factors. One model using dentate patients included: requiring help with feeding (odds ratio (OR) = 13.9), chronic obstructive pulmonary disease (COPD) (OR = 4.7), diabetes mellitus (OR = 3.5), number of decayed teeth (OR = 1.2), number of functional dental units (OR = 1.2), presence of important organisms for decay, *Streptococcus sobrinus* in saliva (OR = 6.2), and periodontal disease, *Porphyromonous gingivalis* in dental plaque (OR = 4.2), and *Staphylococcus aureus* presence in saliva (OR = 7.4). The second model, containing both dentate and edentulous patients included: requiring help with feeding (OR = 4.7), COPD (OR = 2.5), diabetes mellitus (OR = 1.7), and presence of *S. aureus* in saliva (OR = 8.3). CONCLUSION: This study supports the significance of oral and dental factors while controlling for established medical risk factors in aspiration pneumonia incidence.

REF ID: 3178

Level V: Literature review

Topic 3: Assessment

Thomson, W. M. (2005). Issues in the epidemiological investigation of dry mouth. *Gerodontology*, 22(2), 65-76.

Journal Article; Review; D

Despite decades of research, much remains unanswered about the epidemiology of dry mouth. This review aims to provide an overview of the condition's epidemiology and the issues to consider when planning an epidemiological study of dry mouth. The latter can be broadly grouped into: study design; sampling and statistical power considerations; the measurement of dry mouth; and the selection, nature and measurement of relevant exposure measures, including medications and potential confounding variables. Each of these is discussed, in order to provide guidance for prospective researchers based on experience with past research. Finally, an agenda for further epidemiological research into dry mouth is proposed.

REF ID: 3139

Level IV: Non-experimental study

Topic 1: Risks

Tilling, E. (2001). Patient's perceptions of the role of smoking on their oral health. *Dental Health*, 40(1), 3-6.

Journal Article, Research, Tables/Charts

In the last two decades smoking has been identified as the major preventable cause of disease in the modern world. About 3 million people die each year from smoking related disease in economically developed countries, half of them before the age of 70. Smoking is the number one environmental risk factor for both

periodontal disease and delayed healing after periodontal surgery. People who smoke have more calculus as a result of increased salivation, they have more plaque, and they have more periodontal disease than people that do not smoke. It might be thought highly unlikely, in the face of life threatening diseases, that people would abstain from smoking merely to avoid dental problems. However, there is evidence to suggest that whilst denying the potential longterm health risks of smoking, smokers can be sensitive to its short-term consequences. Our profession is in the unique position of being able to show patients clinical signs of the effects of smoking on their oral tissues, so that its potential consequence, the loss of teeth, may make a more powerful impact than the general warnings about the effects of smoking on health. We know that knowledge is certainly an important factor in behavioural change as suggested in the Health Belief Models So...do the patients understand or indeed have any knowledge of the potential effects of tobacco on the oral tissues? This paper describes a study which set out to explore patients' perceptions of the role of smoking on their oral health.

REF ID: 3207

Level V: Literature review

Topic 3: Assessment

Tozum, T. F., & Taguchi, A. (2004). Role of dental panoramic radiographs in assessment of future dental conditions in patients with osteoporosis and periodontitis. *The New York State Dental Journal*, 70(1), 32-35.

Journal Article; Review; D; IM

Osteoporosis affects large segments of elderly populations, especially postmenopausal women. Bone mineral density (BMD) assessment of the skeleton by means of several pieces of equipment, such as dual-energy X-ray absorptiometry, have been useful in identifying individuals with low BMD or at high risk of suffering osteoporotic fracture. Recent investigators have demonstrated a significant association between BMD of the mandible and the peripheral skeleton in postmenopausal women. Some studies also have linked low BMD of the mandible and the peripheral skeleton with alveolar bone loss of the mandible and tooth loss. Dental panoramic radiology is a useful imaging modality by which the dentist can evaluate the whole dentition as well as the jawbones. Clinicians have started to focus on some mandibular panoramic indices, such as mandibular cortical index and mandibular cortical thickness, for the identification of elderly individuals who should undergo BMD assessment. In comparison with peripheral BMD measurement equipment in the medical field, the dentist will be able to identify osteoporotic elderly individuals by means of dental panoramic radiographs taken for the diagnosis of the teeth and the jawbones without additional cost. It is likely that the clinician may estimate the future risk of tooth loss in elderly individuals with periodontitis and osteoporosis by dental panoramic radiographs.

REF ID: 3274

Level IV: Non-experimental study

Topic 3: Assessment

Tsakos, G., Marcenes, W., & Sheiham, A. (2001). Cross-cultural differences in oral impacts on daily performance between greek and british older adults. *Community Dental Health*, 18(4), 209-213.

Journal Article; D; IM

OBJECTIVE: To examine whether there are significant cross-cultural differences in oral health-related quality of life and perceived treatment need between older people of similar clinical oral status living in Greece and Britain. **BASIC RESEARCH DESIGN:** Cross-sectional surveys of adults living independently aged 65 years or older. In Britain, data from the national diet and nutrition survey were used, while the Greek sample was drawn from two municipalities in Athens. Participants 753 in Britain and 681 in Greece. **MAIN OUTCOME MEASURES:** Oral health-related quality of life, assessed through the modified Oral Impacts on Daily Performance (OIDP) indicator, and perceived need for dental treatment. **RESULTS:** Thirty-nine per cent of Greek and 12.3% of British dentate and 47.6% of Greek and 16.3% of British edentulous participants had experienced oral impacts affecting their daily life in the last six months. The most prevalent impact was difficulty eating. Apart from that, 56.3% of Greek and 37.1% of British dentate and 33.5% of Greek and 25.3% of British edentulous participants perceived dental treatment need. After controlling for sociodemographic variables, perceived general health and clinical oral status, Greek dentate and edentulous

participants were significantly more likely to experience oral impacts than their British counterparts, while in relation to perceived treatment need significant cross-cultural differences existed only between dentate respondents. **CONCLUSIONS:** The results indicated an independent cultural influence in the perception of oral impacts in older people.

REF ID: 3219

Level II: Individual experimental study

Topic 2: Prevention

Ueda, K., Toyosato, A., & Nomura, S. (2003). A study on the effects of short-, medium- and long-term professional oral care in elderly persons requiring long-term nursing care at a chronic or maintenance stage of illness. *Gerodontology*, 20(1), 50-56.

Clinical Trial; Journal Article; D

OBJECTIVE: The purpose of the present study is to clarify the frequency of provision of effective professional oral care by dental health workers in order to improve the oral hygiene state of elderly persons requiring long-term care. **METHODS:** In 105 patients requiring long-term nursing care, 55 subjects with positive oral *Candida albicans* were divided into five groups according to the frequency of oral care intervention at intervals of 1, 2, 3, 4 and 6 weeks. The effects of professional oral care on the improvement of the oral hygiene state were investigated taking the frequency and duration of care into consideration. **RESULTS:** The results showed that oral hygienic condition could be improved by performing professional oral care at intervals of 1 week for 12 consecutive weeks, and the improved condition could be maintained when professional oral care was continued at intervals of 1 week thereafter. **CONCLUSION:** It is necessary to continue professional oral care at intervals of 1 week for 12 consecutive weeks and at intervals of 2 weeks for more than 20 weeks. The oral hygiene state could be improved by professional intervention at intervals of three or four weeks in long-term oral care, but this was limited to subjects whose Functional Independence Measure (FIM) scores were higher than 3.

REF ID: 3203

Level II: Individual experimental study

Topic 2: Prevention

Ueda, K., Yamada, Y., Toyosato, A., Nomura, S., & Saitho, E. (2004). Effects of functional training of dysphagia to prevent pneumonia for patients on tube feeding. *Gerodontology*, 21(2), 108-111.

Clinical Trial; Controlled Clinical Trial; Journal Article; D

OBJECTIVE: The purpose of this study was to evaluate the effects of functional training on outbreak frequency of pneumonia for the elderly dysphagia patients who were being tube fed. **METHODS:** Subjects were divided into two groups; one group (n = 10) received oral care (i.e. non-training group) and the other group (n = 11) received functional training of dysphagia in addition to oral care (i.e. training group). The dental health team treated subjects once a week for 3 years (1999-2001). The frequency of pneumonia outbreaks and changes in activities of daily living scale (ADL) were evaluated for each year. **RESULT:** It was recognised that the frequency of pneumonia in the training group decreased year by year ($p < 0.05$). Cognitive items in ADL improved in two subjects of the training group. No statistical differences were recognised in the non-training group. **CONCLUSION:** It was suggested that once-a-week functional training of dysphagia with professional oral care might be effective in preventing pneumonia for elderly people who were being tube fed.

REF ID: 3137

Level I: Systematic Review

Topic 2: Prevention

United States Department of Health and Human Services. Centers for Disease Control and Prevention. (2001). Promoting oral health: Interventions for preventing dental caries, oral and pharyngeal cancers, and sports-related craniofacial injuries: A report on recommendations of the task force on community preventive services. *MMWR: Morbidity and Mortality Weekly Report*, 50(RR-21), 1-13.

Journal Article, Practice Guidelines, Tables/Charts

The Task Force on Community Preventive Services (the Task Force) has conducted systematic reviews of the evidence of effectiveness of selected population-based interventions to prevent and control dental caries (tooth decay), oral (mouth) and pharyngeal (throat) cancers, and sports-related craniofacial injuries. The Task Force

strongly recommends community water fluoridation and school-based or school-linked pit and fissure sealant delivery programs for prevention and control of dental caries. Using the rules of evidence it has established, the Task Force found insufficient evidence of effectiveness or ineffectiveness of the remaining interventions reviewed. Therefore, the Task Force makes no recommendation for or against use of statewide or communitywide sealant promotion programs, population-based interventions for early detection of precancers and cancers, or population-based interventions to encourage use of helmets, facemasks, and mouthguards to reduce oral-facial trauma in contact sports. The Task Force's finding of insufficient evidence indicates the need for more research on intervention effectiveness. Until the results of such research become available, readers are encouraged to judge the usefulness of these interventions by other criteria. This report presents additional information regarding the recommendations, briefly describes how the reviews were conducted, and provides information designed to help apply the strongly recommended interventions locally.

REF ID: 3205

Level II: Individual experimental study

Topic 4.4: Management-Products

Verma, S., & Bhat, K. M. (2004). Acceptability of powered toothbrushes for elderly individuals. *Journal of Public Health Dentistry*, 64(2), 115-117.

Clinical Trial; Controlled Clinical Trial; Journal Article; D; IM

OBJECTIVES: This study evaluated the usefulness of powered toothbrushes in elderly individuals for removing supragingival plaque and improving gingival health and comparing this to the use of regular manual toothbrushes. **METHODS:** Fourteen persons aged 68-85 years having moderate gingivitis were included in the study. A crossover clinical trial consisting of two phases of three months' duration each was carried out. All the participants were given an oral prophylaxis, following which they were instructed to use the manual toothbrush for three months. Again, for the same subjects, an oral prophylaxis was given and they were asked to use the powered toothbrush for the next three months. Plaque Index and Gingival Index scores were recorded one, two, and three months after the use of each toothbrush. Oral hygiene instruction was reinforced only at baseline. **RESULTS:** The powered toothbrush was more effective than a regular manual toothbrush in removing plaque and controlling gingivitis. **CONCLUSION:** The powered toothbrush may prove to be a good alternative to the manual toothbrush for this segment of the population, as it does not require any special dexterity to use.

REF ID: 3193

Level V: Literature review

Topic 1: Risks

Walls, A. W., & Steele, J. G. (2004). The relationship between oral health and nutrition in older people. *Mechanisms of Ageing and Development*, 125(12), 853-857.

Journal Article; Review; IM

The oral health of older people is changing with reducing numbers of people relying on complete dentures for function, and retaining some natural teeth. Despite this there are substantial numbers of older people whose ability to chew foods is compromised by their oral health status, either because they have few or no natural teeth. This alteration results in individuals selecting a diet that they can chew in comfort. Such diets are low in fruits and vegetables intake with associated reduction in both non-starch polysaccharide and micronutrient intakes. There is also a trend for reduced dietary intake overall. Salivary flow and function may have an impact in relation to the ability to chew and swallow. Whilst there are few differences in salivary function in fit healthy unmedicated subjects, disease resulting in reduced salivary flow and particularly polypharmacy, with xerostomia as a side effect, are likely to have a role in older people. This paper explores the relationships between oral health status and food's choice and discusses the potential consequences for the individual of such dietary change.

REF ID: 3246

Level II: Individual experimental study

Topic 3: Assessment

Wardh, I., Berggren, U., Andersson, L., & Sorensen, S. (2002). Assessments of oral health care in dependent older persons in nursing facilities. *Acta Odontologica Scandinavica*, 60(6), 330-336.

Journal Article; D; IM

The number of dependent elderly with natural teeth is increasing dramatically. If these elderly persons do not receive proper oral health care, severe oral problems are likely to result. In conjunction with an oral health care education program for the staff of nursing facilities, oral health status was assessed and semi-structured interviews performed with residents and their relatives about oral health care. The assessments were made at baseline and at an 18-month follow-up. The project was conducted as a longitudinal, controlled study with an intervention and a control group. The aim of the study was to evaluate differences between the intervention and control group after oral health care intervention. At follow-up, it was shown that the intervention group had established more dental contacts. However, the results also indicated that the residents were not concerned about their oral health. Nursing staff therefore have to be responsible for oral health care if improved care for residents is to be realized.

REF ID: 3124

Level IV: Non-experimental study

Topic 4: Management

Wardh, I., Hallberg, L. R., Berggren, U., Andersson, L., & Sorensen, S. (2003). Oral health education for nursing personnel; experiences among specially trained oral care aides: One-year follow-up interviews with oral care aides at a nursing facility. *Scandinavian Journal of Caring Sciences*, 17(3), 250-256.

Journal Article, Pictorial, Research

The improved dental health in most industrialized countries is not apparent among elderly and long-term care patients. Oral healthcare has been found to have low priority in nursing care. To create lasting positive effects in oral healthcare education, a new educational model was tested in an oral healthcare project. After approval from ethical committee, nursing assistant and nurses' aides took part in a dental auscultation period at a dental clinic to serve as oral care aides additional to traditional oral healthcare education. Following this period, the aides were given responsibility for the oral healthcare at their ward. After serving as oral care aides for 1 year, interviews were made and analysed based on the Grounded Theory methodology. The aim was to investigate how the oral care aides had experienced their new duties regarding oral healthcare. The results indicated that, despite several environmental changes, reluctant residents and occasional lack of commitment from colleagues, the oral care aides felt responsible for the oral healthcare provision. The oral care aides expressed courage, the capacity to cope with reality, confirmation and empathy, characteristics that propelled them from novices to oral care aides with an expert competence.

REF ID: 3286

Level II: Individual experimental study

Topic 4.4: Management-Products

Warren, P. R., Cugini, M., Marks, P., & King, D. W. (2001). Safety, efficacy and acceptability of a new power toothbrush: A 3-month comparative clinical investigation. *American Journal of Dentistry*, 14(1), 3-7.

Clinical Trial. Journal Article. Randomized Controlled Trial

PURPOSE: To compare the safety and efficacy of a new power toothbrush (Braun Oral-B D17) with an ADA reference manual toothbrush. **MATERIALS AND METHODS:** 110 healthy subjects, 18-65 yrs of age, with a mean plaque index of ≥ 1.80 and a gingival index of ≥ 1.00 , were enrolled in this 3-month, randomized, parallel-group, examiner-blind study. Oral soft and hard tissues were examined for safety, and plaque, gingivitis and bleeding were measured to evaluate efficacy. Measurements were made at baseline and after 1 and 3 months of product use. Following the baseline visit and randomization, subjects were instructed to brush twice daily for 2 mins with their assigned brush. **RESULTS:** 101 subjects completed the study with evaluable data for all time periods, 52 in the D17 group and 49 in the manual group. None of the nine withdrawals from the study were related to product use and no product-related adverse effects were reported. There was no clinically significant soft or hard tissue abrasion observed at any time point in either group. After 1 and 3 months, significant reductions from baseline in whole mouth and interproximal plaque, gingivitis and bleeding were observed in both groups. A comparison of the two groups revealed that the whole mouth and approximal plaque indices were reduced to a significantly greater extent in the D17 group after

both 1 and 3 months. The whole mouth gingival index was also reduced to a greater extent in the D17 group at 1 and 3 months, but a difference in the approximal gingival index was only apparent after 3 months. With respect to the bleeding index, there was a significant difference between the two groups for the whole mouth at both 1 and 3 months, but the differences in favor of the D17 for approximal values did not achieve statistical significance. In conclusion, the D17 was found to be safe and had increased efficacy with respect to reduction of plaque and gingivitis, compared with a manual toothbrush.

REF ID: 3196

Level II: Individual experimental study

Topic 2: Prevention

Watando, A., Ebihara, S., Ebihara, T., Okazaki, T., Takahashi, H., & Asada, M. et al. (2004). Daily oral care and cough reflex sensitivity in elderly nursing home patients. *Chest, 126(4), 1066-1070.*

Clinical Trial; Journal Article; Randomized Controlled Trial; AIM; IM

BACKGROUND: Intensive oral care can reduce the incidence of pneumonia in elderly nursing home patients, but the mechanism is unknown. OBJECTIVE: To explore the effects of intensive oral care on impaired cough reflex sensitivity, which is a known risk factor of aspiration pneumonia. METHODS: Cough reflex sensitivity to citric acid was measured in elderly nursing home patients, who were randomly assigned to the intervention group (n = 30) and the control group (n = 29). The patients in the intervention group had their teeth and gingiva cleaned by caregivers after every meal for 1 month. The patients in the control group performed their own oral care during the same period. Serum substance P (SP) concentration, cognitive function, and activities of daily living (ADL) were also assessed. RESULTS: In the intervention group, cough reflex sensitivity at 30 days showed significantly higher sensitivity than baseline (p < 0.01). At 30 days, the cough reflex sensitivities in the intervention group were significantly higher than that of the control group (p < 0.05). Compared with the control group, the odds ratio of improvement of cough reflex sensitivity was 5.3 (95% confidence interval, 1.7 to 16.0; p < 0.005) for the intervention group. One month of intensive oral care did not have a significant effect on serum SP concentration, cognitive function, and ADL. CONCLUSION: Intensive oral care may reduce the incidence of pneumonia by improving cough reflex sensitivity in elderly nursing home patients.

REF ID: 3237

Level V: Literature review

Topic 4: Management

Watson, R., Manthorpe, J., & Stimpson, A. (2003). Learning from carers' experiences: Helping older people with dementia to eat and drink. *Nurs.Older People, 14(10), 23-7; quiz 28.*

Journal Article; Review; N

Eating and drinking difficulties are common in people with dementia and yet some health staff are inclined to neglect this important area of care. This article explores how, combined with the skills of nurses, the experiences of those caring for relatives with dementia can help potential problems to be avoided.

REF ID: 3117

Level IV: Non-experimental study

Topic 1: Risks

Weyant, R. J., Newman, A. B., Kritchevsky, S. B., Bretz, W. A., Corby, P. M., & Ren, D. et al. (2004). Periodontal disease and weight loss in older adults. *Journal of the American Geriatrics Society, 52(4), 547-553.*

Journal Article, Research, Tables/Charts

OBJECTIVES: To determine the association between periodontal disease and weight loss in an elderly cohort. DESIGN: A longitudinal design was used with participants from the Health, Aging and Body Composition (Health ABC) cohort study to determine the association between periodontal disease status and weight loss of at least 5% of baseline body weight over a period of 2 years. SETTING: Participants were examined in research clinics in Pittsburgh, Pennsylvania, and Memphis, Tennessee. PARTICIPANTS: A randomly selected subset of 1,053 individuals from the Health ABC examination, aged 65 and older, ambulatory and community-dwelling at baseline. MEASUREMENTS: Periodontal disease was measured as mean pocket depth and attachment loss, extent (percentage) of pockets with at least 6 mm probing depth, extent of bleeding on probing, and tissue inflammation. RESULTS: In logistic regression models adjusting for variables that may

explain weight loss, extent of periodontal pockets with at least 6 mm probing depth showed a significant association with weight loss (odds ratio=1.53, 95% confidence interval=1.32-1.77). CONCLUSION: Periodontal disease may be causally related to weight loss in the elderly and thus may increase risk of morbidity and mortality.

REF ID: 3111

Level IV: Non-experimental study

Topic 3: Assessment

Wilson, T., & Gembica, A. (2004). A report of oral screenings of residents of two nebraska nursing homes. *Journal of Dental Hygiene*, 78(4), 1.

Journal Article, Abstract, Research

REF ID: 3122

Level IV: Non-experimental study

Topic 3: Assessment

Wolowski, A., Runte, C., & Helms, S. (2003). Oral dryness: Subjective perception and objective causes. *Journal of the American Geriatrics Society*, 51(11), 1678-1679.

Journal Article, Letter, Research, Tables/Charts

REF ID: 3262

Level IV: Non-experimental study

Topic 3: Assessment

Wong, M. C., Liu, J. K., & Lo, E. C. (2002). Translation and validation of the chinese version of GOHAI. *Journal of Public Health Dentistry*, 62(2), 78-83.

Journal Article; Validation Studies; D; IM

OBJECTIVE: To translate and validate the Chinese version of General Oral Health Assessment Index (GOHAI) for elderly in Hong Kong and to investigate factors that possibly may influence the GOHAI scores. **METHODS:** The English version of GOHAI was translated into Chinese. Persons aged 60-80 years were interviewed by two trained interviewers and clinically examined by a dentist. Information on subjects' demographic background and oral health conditions was collected. **RESULTS:** Altogether 1,023 elderly were interviewed and clinically examined. The mean GOHAI score was 48.9 (SD = 7.2). Cronbach's alpha of the translated GOHAI was 0.81; item-scale correlation ranged from 0.28-0.61. It was found that the mean GOHAI scores were lower for subjects with poorer perceived oral health ($r_s = 0.57, P < .001$). Elderly who had perceived dental treatment need had a lower mean GOHAI score than those who did not ($P < .001$). It was also found that elderly who lived in elderly homes, those who received social welfare assistance, those who had recent dental visits, and those with higher DMFT scores had higher mean GOHAI scores. **CONCLUSION:** The translated Chinese version of GOHAI demonstrated acceptable reliability and validity. It is available for use by researchers in oral health-related quality of life studies on Chinese elderly population.

REF ID: 3094

Level IV: Non-experimental study

Topic III: Assessment

Wong, M. C. M., Lo, E. C. M., & McMillan, A. S. (2002). Validation of a chinese version of the oral health impact profile (OPIP). *Community Dentistry and Oral Epidemiology*, 30(6), 423-430.

Journal Article, Research, Tables/Charts

OBJECTIVES: To translate the original English version of Oral Health Impact Profile (OHIP) into a Chinese version, to validate the translated instrument for use among the elderly in Hong Kong and to derive a Chinese short-form OHIP. **METHODS:** The original English version of OHIP was translated into Chinese. Elderly persons aged 60-80 years were interviewed by two trained interviewers and examined clinically by one of two calibrated dentists. Information on subjects' demographic background and oral health conditions were collected. **RESULTS:** A total of 586 elderly persons were interviewed and clinically examined. Cronbach's alpha of the translated OHIP subscales ranged from 0.69 to 0.84 and the test-retest correlation coefficient ranged from 0.72 to 0.92. Construct validity of the translated Chinese version was supported by the finding that the OHIP-49 and subscale scores increased as the subject's perceived oral health status changed from healthy to unhealthy. Also, those who had a perceived dental treatment need had higher mean OHIP-49 and

subscale scores compared to those who did not. The short-form OHIP derived in this study demonstrated comparable validity and reliability with the full version of OHIP. **CONCLUSION:** The translated Chinese version of OHIP demonstrated good validity and reliability. It is available for use by researchers in oral health-related quality of life studies in Chinese elderly populations. In situations where a Chinese short-form of OHIP is desirable, there are now two validated Chinese versions for researchers to choose.

REF ID: 3151

Level V: Program evaluation

Topic 4: Management

Wyatt, C. C., So, F. H., Williams, P. M., Mithani, A., Zed, C. M., & Yen, E. H. (2006). The development, implementation, utilization and outcomes of a comprehensive dental program for older adults residing in long-term care facilities. *Journal of the Canadian Dental Association*, 72(5), 419.

Journal Article; D; IM

This paper documents the experience of the University of British Columbia's Geriatric Dentistry Program (GDP) with emphasis on the dental treatment needs of patients during its first year of operation. The GDP provided access to dental care for residents of long-term care facilities, education for hospital staff concerning daily mouth care, education of dental students and an opportunity for research. The first year of clinical activity saw a small, yet significant, improvement in oral health for residents using the dental services. We hope that the outcomes of this new dental program for long-term care facilities will encourage dentists to provide care for this vulnerable population.

REF ID: 3098

Level III: Quasi-experimental study

Topic 3: Assessment

Yamada, H., Nakagawa, Y., Nomura, Y., Yamamoto, K., Suzuki, M., & Watanabe, N. et al. (2005). Preliminary results of moisture checker for mucus in diagnosing dry mouth. *Oral Diseases*, 11(6), 405-407.

Journal Article, Pictorial, Research, Tables/Charts

Objective: To evaluate the ability of Moisture Checker for Mucus (MCM), a device which measures the weight percent of water content in the oral mucosal epithelium, for the diagnosis of dry mouth. **Method:** Forty-three consecutive patients seen at the Dry Mouth Clinic of Tsurumi University were divided into two groups by the diagnostic criteria of hyposalivation defined by the stimulated salivary flow rate ≤ 10 ml per 10 min. The MCM values in the buccal, tongue and labial mucosa in each group were compared. **Results:** The value of the normal salivation group was significantly higher when compared with that of the hyposalivation group both in the buccal and tongue mucosa, $P = 0.01$ and $P = 0.046$, respectively. **Conclusion:** Moisture Checker for Mucus has the potential to be a useful device in the screening of hyposalivation.

REF ID: 3266

Level II: Individual experimental study

Topic 2: Prevention

Yoneyama, T., Yoshida, M., Ohru, T., Mukaiyama, H., Okamoto, H., & Hoshihara, K. et al. (2002). Oral care reduces pneumonia in older patients in nursing homes. *Journal of the American Geriatrics Society*, 50(3), 430-433.

Clinical Trial; Journal Article; Randomized Controlled Trial; IM

OBJECTIVES: Aspiration of oral secretions and their bacteria is increasingly being recognized as an important factor in pneumonia. We investigated whether oral care lowers the frequency of pneumonia in institutionalized older people. **DESIGN:** Survey. **SETTING:** Eleven nursing homes in Japan. **PARTICIPANTS:** Four hundred seventeen patients randomly assigned to an oral care group or a no oral care group. **INTERVENTION:** Nurses or caregivers cleaned the patients' teeth by toothbrush after each meal. Swabbing with povidone iodine was additionally used in some cases. Dentists or dental hygienists provided professional care once a week. **MEASUREMENTS:** Pneumonia, febrile days, death from pneumonia, activities of daily living, and cognitive functions. **RESULTS:** During follow-up, pneumonia, febrile days, and death from pneumonia decreased significantly in patients with oral care. Oral care was beneficial in edentate and dentate patients. Activities of daily living and cognitive functions showed a tendency to improve with oral

care. CONCLUSION: We suggest that oral care may be useful in preventing pneumonia in older patients in nursing homes.

REF ID: 3235

Level II: Individual experimental study

Topic 2: Prevention

Yonezawa, H., Takasaki, K., Teraoka, K., Asaka, T., Sato, C., & Tsuchiya, K. (2003). Effects of tongue and oral mucosa cleaning on oral candida species and production of volatile sulfur compounds in the elderly in a nursing home. *Journal of Medical and Dental Sciences*, 50(1), 1-8.

Clinical Trial; Journal Article; Randomized Controlled Trial; IM

The purpose of this study was to investigate the effects of oral care using simple tools and methods on the cleanliness of the oral cavity in the elderly. Enrolled were 84 elderly subjects with a mean (+/-S.D) age of 85.1+/-7.0 years in a nursing home. They were given tongue and oral mucosa cleaning (the oral care) after lunch every day or every other day for two consecutive weeks by the authors. The effect of the oral care was studied in terms of Candida scores in tongue coating, concentration of volatile sulfur compounds (VSC) which are the main causative substance of bad breath, and change in tongue coating scores. The above parameters were measured five times; just before the oral care program, weekly during, and at the end of the oral care program. The groups of patients, who were given the oral care, especially the group of patients cared with sponge brushes every day, showed a significant reduction in Candida scores but not in VSC concentration and tongue coating scores. The present method of oral care proved effective in cleaning the tongue and oral mucosa, and the Candida scores appeared to be a reliable indicator for evaluation. It is suggested that this way of oral care is simple, easy and useful not only for the elderly at a nursing home but for the house-bound elder people who will rapidly increase in the near future in Japan.

REF ID: 3072

Level IV: Non-experimental study

Topic 4.4: Management-Products

Zlataric, D. K., Celebic, A., ValenticPeruzovic, M., Jerolimov, V., & Panduric, J. (2003). A survey of treatment outcomes with removable partial dentures. *Journal of Oral Rehabilitation*, 30(8), 847-854.

Journal Article, Research, Tables/Charts

The patient's satisfaction with removable partial denture (RPD) therapy has become an increasingly important factor in prosthetic treatment. This study examined patients' satisfaction with RPDs in relation to some socio-economic variables, patients' habits of wearing and cleaning RPDs, comfort of wearing RPDs and different RPDs characteristics. A questionnaire was devised for the purpose. Two hundred and five patients were required to assess satisfaction with RPDs. They graded RPDs, depending on the level of satisfaction, on scale ranging from 1 to 5. A dentist determined Kennedy classification, material and denture support, denture base shape, number of missing teeth and evaluated denture construction. Majority of the patients were satisfied with the prosthesis. The patients of a higher education level gave lower grades ($P < 0.05$) to aesthetics of maxillary RPDs. Almost half of the patients were wearing RPDs during the day. Most of the patients cleaned RPDs three times a day. A significant difference was found between the patients' grades for comfort of wearing mandibular RPDs and number of missing teeth and between hygiene of mandibular RPDs and habits of cleaning them. Majority of the patients treated with RPDs were satisfied with the prosthesis. Dissatisfaction was related to mastication, esthetics, number of missing teeth and maintenance of oral hygiene.