A DESCRIPTION OF THE STATUS OF THE ORAL CAVITY

OF ELDERLY PATIENTS AT ADMISSION AND AFTER

ONE WEEK OF HOSPITALIZATION

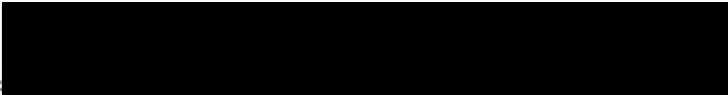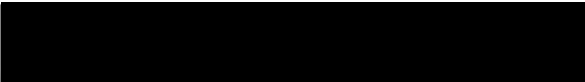by

Jessie F. Zavin, R.N., B.S.

A Thesis

Presented to
The University of Oregon Health Sciences Center
School of Nursing
in partial fulfillment
of the requirements for the degree of
Master of Nursing

June 8, 1980

APPROVED:

Sharon R. Clark, R.N., M.N., Assistant Professor
Thesis Advisor

Charold L. Baer, R.N., Ph.D., Professor
First Reader

Margaret Auld Bruya, R.N., M.N., Associate Professor
Second Reader

Carol A. Lindeman, Ph.D., Dean, School of Nursing

ACKNOWLEDGEMENTS

This thesis was made possible only by the help and support of many individuals. For every problem which arose, there was someone who offered their time and talents to bring the effort closer to completion. To the following people, I wish to express a special thanks as it would have been extremely difficult, if not impossible, to have accomplished this project without them.

To Sharon Clark, R.N., M.N., for her continual support and guidance as my thesis advisor.

To my readers, Margaret Bruya, R.N., M.N., and Charold Baer, R.N., Ph.D., who gave of their special talents and time.

To Joyce Semradek, R.N., M.S.N., for the uncountable hours she spent helping to make workable the ideas which formed the basis of the study.

To Howard Creamer, Ph.D., and Margaret Ryan, R.D.H., M.S., for their dental expertise and guidance.

To Larry Thompson, D.D.S., Virginia Hanson, D.D.S., and Marlene Nelson who provided practical support during data collection.

To my friends, Deborah Layman, R.N., and Renee Pike, R.N., for their continual and unfailing emotional support which, at times, was the most important factor in the whole process.

Finally, to my daughter, Julie, who by her love and confidence, spurred me to accomplishments I never dreamed were possible.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter I

INTRODUCTION

Adequate oral hygiene is of prime importance to the elderly patient. Limited reserve capacities, changes in oral structures, diminution in self-care abilities, chronic disease processes and their treatment all serve to make the aged vulnerable to detrimental mouth changes. Such a compromised oral status may have far reaching consequences for the elderly hospitalized patient. Some of those consequences include: inadequate nutritional intake; increased susceptibility to local or systemic infection; interference with psychic health; lengthened hospital stay and other complications in already present disease processes.

The most serious and frequent oro-dental problem of the aged is periodontal disease and an undisputed relationship exists between mouth cleanliness and periodontal disease (Reitz, 1971; Steele, 1966). Plaque, composed of mucin, bacteria, food, and cellular debris, becomes calcified if not promptly removed. Resultant calculus causes irritation to the gingival tissues. Gingivitis, manifested by swelling, bleeding, and/or gum recession with pocket formation may lead, if unchecked, to full-blown periodontal disease. Worsening of the above conditions, loosening of teeth and pus formation are consequences which are not well tolerated by the aged (Block, 1976; Dyer, Monson, & Cope, 1976; Lovelock, 1973; Redman & Redman, 1967).

Elderly patients may be exposed to additional oral stressors during hospitalization. Dietary changes, NPO or fluid restriction, oxygen administration, and activity limitations have a very real place in the management of disease processes to which the elderly are prone. These treatment modalities are often vital for overall health management, yet they may serve to diminish the already limited reserve capacities of oral structures caused by aging.

Nurses have a responsibility to promote oral health with all patients, but this is especially true with the elderly patient. Nursing interventions are based on an assessment of oral status and may consist of patient education, encouragement, or actual performance of oral care measures. Textbooks, clinical articles and hospital personnel all stress the importance of oral hygiene nursing care. Yet, there is a paucity of studies which address oral hygiene status in the nursing literature. None were found which assessed the oral status of elderly patients upon admission to the hospital and what occurs after a period of hospitalization when usual nursing care measures are employed.

The focus of this study is to describe the oral cavity status of patients, 60 years and older, at the time of admission to a general medical or surgical floor and one week later.

<u>Review of the Literature</u>

Oral health needs of the elderly should be a concern of health care professionals, because the mouth and related structures influence and/or are influenced by other body systems and the organism as a whole. Additional stress placed on already limited reserves by disruptions in oral integrity is not well tolerated. The literature is replete with articles stressing the importance of optimal oral status and the relationship of hygiene measures to a healthy mouth. Knowledge of the structure and function, normal and pathological changes and hygiene measures may be utilized by the nurse to accurately assess and choose appropriate interventions for the elderly hospitalized patient. A literature review covering oral health as it is influenced by aging, disease processes and hospitalization, and nursing responsibilities for oral care is discussed below.

<u>The Oral Cavity: Influences of Aging,</u>
<u>Disease and Treatment Modalities</u>

The oral cavity consists of teeth, periodontal and gingival tissues, oral mucosa, tongue, lips and salivary glands. Aging, disease and treatment modalities can exert an effect on any or all of these structures. A change in one part often effects changes in surrounding structures as a result of their functional and structural interrelationships. Each of these structures will be considered separately with a discussion of normal characteristics, influences of aging

and disruptions due to disease processes, treatment modalities
or other factors included under each subdivision. A dis-
cussion of oral complications of systemic disease processes
and related studies concludes this section.

Dentition. Teeth have as their major function the masti-
cation of foodstuffs (Kart, Metress, & Metress, 1978).
Healthy teeth are immovable, show an absence of debris or
plaque, and no overt dental caries or enamel erosions (Dyer,
et al., 1976; Levine & Grayson, 1973).

Changes in dentition are often observed in the elderly.
Abrasion, fracture, and a process of wearing down of the
occlusal surfaces occur with aging (Epstein, 1976). Reces-
sion of gums with exposure of more fragile and softer cemen-
tum occurs. This makes the tooth more susceptible to trauma
and decay (Epstein, 1976). Plaque and calculus formation
on the teeth increase with age in many persons. This may
lead to periodontal disease which is a significant cause of
tooth loss (Reitz, 1971). Many elderly individuals do, in
fact, have none or only a few of their natural teeth.
Although this is the result of dental neglect and improper
oral hygiene rather than aging per se, the result is limita-
tion of function. Decreased chewing ability leads to inges-
tion of a softer diet, thereby negating the mechanical
cleansing action of high fiber foods as well as their nutri-
tional value (Bhaskar, 1968; Pope, et al., 1975). Oral
hygiene thus becomes particularly important to preserve

remaining function.

Gingival and Periodontal Tissues. Periodontal tissues surround, grip and support the teeth. The gingiva (gums), interdental papillae and periodontal membrane comprise these tissues. Normal healthy gingiva is coral pink although the darkness and pigmentation of the tissues increases with increasing skin pigmentation (Reitz & Pope, 1973). Color is also affected by depth of epithelium and connective tissue as well as blood hemoglobin levels. Free gingiva is smooth and glossy; attached gingiva has a stippled orange peel appearance and is firm and resilient. No exudate or bleeding is seen if gingival tissues are healthy (Reitz & Pope, 1973).

Healthy periodontal tissue is essential for oral integrity. Yet the elderly person is more likely to have gingivitis and periodontal disease than is his younger counterpart due, in large measure, to inadequate oral and dental care over many years (MacPhee & Cowley, 1975).

Any number of factors may play a role in the etiology of periodontal disease. As mentioned earlier, dental plaque and subsequent calculus formation may predispose to gingivitis. Oral debris, composed of mucin, bacteria, food, and cellular products can become attached to the teeth and form dental plaque. If this plaque is not promptly removed, the bacteria will convert sugars present in food to acid. Acid attacks the tooth surface and results in dental caries

(Greene & Vermillion, 1960; Lovelock, 1973). The plaque becomes calcified and irritates the gingival tissues due to the byproducts formed by the microorganisms (i.e., toxins and local immunological responses to bacterial proteins) and mechanical friction of the rough, sandpaper-like surface of the calculus itself. Progression of gingivitis leads to periodontal disease with loosening of the teeth and destruction of alveolar bone (Block, 1976; Dyer, et al., 1976; Lovelock, 1973; Redman & Redman, 1967).

Dental plaque and oral debris can be removed by thorough daily cleaning which may be impossible for the elderly patient to do himself. If this is not accomplished, calcification may begin as early as 24 hours and resulting calculus cannot be removed by usual oral hygiene methods (Dyer, et al., 1976; Lovelock, 1973; Pope, et al., 1975).

Observable manifestations of gingivitis include a swollen appearance of the gums and tendency to bleed easily. They are dark pink, red or blue in color and the gums may recede with pocket formation (Pope, Reitz, & Patrick, 1975). Progression to periodontitis shows worsening of the above conditions, loosening of the teeth, and possible pus formation. Initial stages of this process are painless (Dyer, et al., 1976; Hayward, 1968; Levine & Grayson, 1973; Pope, et al., 1975; Reitz & Pope, 1973).

Other local and systemic factors often present in the elderly individual contribute to gingival irritation and

periodontal disease. Irregularly filed fillings, ill-fitting dentures, irregularly contoured teeth, rough edges of cavities and mouth breathing may all be chronic irritants to the gingival tissues (Reitz, 1971). Ongoing disease processes (i.e., endocrine disorders, nutritional defects, hormonal imbalance, blood dyscrasias) as well as treatment modalities (i.e., chemotherapy, irradiation, certain drugs) can influence periodontal and other oral tissues (Levine & Grayson, 1973; Pope, et al., 1975; Ross, Johnson, & Hayes, 1967). Aged individuals with periodontal disease are also susceptible to systemic complications as a result of bacterial entry into the bloodstream from the mouth (Redman & Redman, 1967).

It is obvious then, that there are a multitude of contributing factors to periodontal disease. Yet the most common cause of chronic gingivitis is inadequate oral hygiene. An almost linear correlation has been demonstrated between the degree of oral uncleanliness and severity of periodontal disease (MacPhee & Cowley, 1975). Adequate oral hygiene is thus mandatory to prevent further tooth loss and preserve periodontal tissues in the elderly. Yet this essential activity may not be accomplished unless the geriatric patient is instructed in its importance. Also, the elderly patient unable to perform adequate oral hygiene measures must rely on the nurse to do it for him if oral integrity is to be preserved (Reitz & Pope, 1973).

Oral Mucosa. The oral mucosa provides the surface covering of the mouth cavity and serves as a protective barrier. It is normally a pale, coral pink color and shows pigmentation changes similar to that of the gingiva. Healthy mucosa is intact and moist (Hayward, 1968). Atrophy and thinning of the oral mucosa, loss of keratinization, and dryness of the mucous membranes due to decreased salivary flow are normal physiological processes which accompany aging (Bhaskar, 1968; Epstein, 1976). Diminution of the protective function due to these changes renders the elderly patient more susceptible to trauma and infection, as does systemic and local factors often present (i.e., renal disease, therapeutic dehydration, hypersensitivities, local trauma) (Ship & Galili, 1971). To compound matters, regeneration of injured tissue is slower in this age group (Reitz & Pope, 1973).

Tongue. The tongue is important for speech articulation, movement of food in the oral cavity and taste perception. The healthy tongue is moist, pink, freely moveable, without evidence of fissures or thick coating (Hayward, 1968; Kerr & Ash, 1978). Changes in taste perceptions accompany aging due to a decrease in the number of taste buds present on each papilla. This results in less sensitivity to all four taste sensations with a preference for tart tasting substances and a decline in sweet choices (Reitz, 1971).

Salivary Glands. Lubrication of the oral cavity is accomplished by salivary secretions. Saliva serves several important functions. Amylase is responsible for beginning hydrolysis of carbohydrates. Mucus protects the oral cavity from dehydration and local irritants and sweeps microorganisms with it to be destroyed in the gastrointestinal tract. Glycoproteins aid in lubrication for speaking and swallowing. Tooth protection is an additional function related to the minerals, electrolyte, and lubricating qualities of saliva. Immunoglobins, lysozymes, and lactoferrin have bacteriocidal, virocidal, or bacterio-static properties. Yet saliva can be an opportune medium for bacterial growth (Rice, 1977).

Salivary flow is markedly diminished in the elderly who show progressive decrease after age 40 (Epstein, 1976; Pope, et al., 1975; Rice, 1977). Hospitalization, dehydration, medications such as tranquilizers and ganglionic blocking agents, various anemias, infection, fatigue and psychological stress also serve to decrease salivary flow (Rice, 1977). These factors only serve to compound already diminished salivary production in the aged, thereby negating the natural cleansing and protective abilities of normal salivary flow.

Effects of Selected Systemic Factors. The influence of local and systemic factors on oral structures has been alluded to previously. In some instances, a definite cause and effect relationship has been demonstrated (i.e., uremic

stomatitis resulting from renal failure) (Shklar & McCarthy, 1976). Other relationships are not as well defined. The severity of oral manifestations following drug therapy, although probably related to dose and time, are not as easy to delineate (Shklar & McCarthy, 1976). Entire books have been written which deal with oral complications of systemic disease processes. Those of particular importance when evaluating an elderly patient population include diabetes, thyroid imbalances, anemia, leukemia, renal failure, nutritional defects, alcoholism and clotting deficiencies. Drug therapy which may further disrupt oral integrity include whole groups of medicines as well as a single drug of a particular classification. Anticholinergics, tranquilizers, anticoagulants, steroids, antibiotics, barbiturates, hormones, diuretics, antihistamines and decongestants are drug classes which have been implicated in the pathogenesis of oral disruptions. Specific drugs cited as having deleterious effects include dilantin, digitalis, and salicylates (Shklar & McCarthy, 1976).

The specific conditions and treatments outlined above compound the geriatric patient's vulnerability to disruptions in oral status. Because normal aging processes are responsible for diminished reserve capacities, the aged have increased difficulty in adjusting to these added insults (U.S. Dept. HEW, 1972). Compounding matters in many elderly individuals is a decrease in self-care abilities. Inability

to perform effective oral care measures is a further indication of potential vulnerability in the geriatric population (Ettinger & Manderson, 1976; Reitz, 1971; Reitz & Pope, 1973).

The results of compromised oral status may have severe consequences for the aged patient. The oral cavity serves as the entrance through which nutrients pass in order to be utilized by the body. Proper functioning is necessary to prepare foodstuffs for further digestion and absorption (Pope, et al., 1975; Schrieber, 1964). The aged patient needs adequate nutritional intake in order for his body to repair and protect itself (Food & Nutr. B., 1974; Young, 1974). Yet dietary status may already be compromised by ongoing disease processes and lack of appetite (Bonner, 1974; Krehl, 1974; Shank, 1976). Further hindrance to overall nutritional status by disruptions of oral integrity are not well tolerated.

The oral cavity serves a protective function by rendering microorganisms present in the mouth harmless to the body (DeWalt, 1975; Maurer, 1977). Reduced salivary flow and friable changes in the oral mucosa diminish the protective capabilities of the older person's mouth (Reitz & Pope, 1973; Schrieber, 1964). The potential for infection is greater and this, coupled with an already debilitated state, makes the elderly particularly prone to complications from poor oral health.

Verbal communication and emotional expression rely on integrity of the oral cavity (Hector, 1970). Appearance and related psychic health may suffer as a result of oral pathology (Dyer, et al., 1976; Epstein, 1976). A positive body image and self-esteem are important for all of us. But if the geriatric patient, who may already be limited in many activities, has these avenues for self-expression and positive outlook cut off, resulting depression and inability to cope with life situations may prove to be disastrous (Hector, 1970).

Related Studies. Studies are limited which deal with the oral health needs of hospitalized patients in general and the elderly in particular. The Council on Hospital Dental Service (1966) conducted a survey to determine the prevalence of oral disease in all patients admitted to a single hospital facility during an eight-month period. Of the 1,634 patients screened, 80% had some degree of oral pathosis, primarily dental caries and periodontal disease. The available data did not delineate patient ages.

McPhetridge (1973), utilizing a nursing history form, looked at dental problems in patients upon admission to a general medical or surgical floor. Items of interest in determining dental problems included patient report of mouth soreness, difficulty in eating because of oral disruptions, presence of dentures, cavities, whether or not a toothbrush was brought to the hospital, and any assistance

needed with oral care measures. The investigator found that out of 100 responses, 75% of adult patients (21 years of age and older) had dental problems upon admission to the hospital. There was no significant correlation between dental problems and age.

No nursing studies were found which dealt specifically with the oral status of elderly hospitalized patients. DeWalt (1975) and Van Drimmelen and Rollins (1969) conducted studies which addressed oral status in elderly patients receiving specific nursing interventions. The subjects were long-term residents of extended care facilities, however, rather than patients in an acute care hospital. Additional studies are needed which document the incidence of oral cavity deficiencies present in elderly patients upon admission to the hospital and describe what changes, if any, occur after a period of hospitalization.

Nursing Responsibilities for Oral Care

Effective oral hygiene prevents or retards detrimental mouth changes (Steele, 1966). Ensuring that these measures are performed is a nursing responsibility (Reitz & Pope, 1973). Oral hygiene can be defined as "those measures which are taken to promote and maintain a satisfactory state of health (a physiological state which predisposes to normal function) of the tissues and secretions of the oral cavity" (MacLennan, 1974). The main objectives of oral care are twofold--to remove foreign material and debris from the

mouth and teeth so that calcification and periodontal disease are prevented and to maintain the tone and health of the tissues by mechanical stimulation. Maintenance of moisture is also an important consideration for many individuals (Redman & Redman, 1967).

It is generally agreed that use of a tooth brush is the most effective means for removing plaque and oral debris from the teeth. A study of young males showed a significant reduction ($p < .05$) of calculus and soft tissues debris scores with greater frequency of toothbrushing. Those subjects brushing once or twice daily had a respective 21 to 31% decrease in oral hygiene scores when compared to individuals brushing less than once a day, indicating greater mouth cleanliness with increased brushing frequency (Greene & Vermillion, 1960). An additional benefit can be stimulation and toughening of the gums and tongue (Redman & Redman, 1967; Reitz & Pope, 1973).

DeWalt (1975) studied the effectiveness of a toothbrush or toothette in improving the oral status of elderly residents of an extended care facility. Significant improvement ($p = .05$) was noted in five of nine dependent variables constituting oral status when mouth care was performed at four-hour intervals. Toothbrushing was most effective in removing tooth debris and stimulating the gingival tissues. The toothette caused significant improvement in tongue color, condition of the oral membranes and lip texture scores ($N = 48$).

Dental floss is a useful adjunct to the toothbrush. It reaches interproximal areas that cannot be cleaned any other way and is superior, in this regard, to toothpicks or water pick appliances (Reitz & Pope, 1973).

The need for oral hygiene is undisputed. Maurer (1977) notes that an oral care plan, in order to be beneficial, "should be based on the nurse's ongoing assessment of the client's oral condition" beginning with initial assessment at time of admission to a health care facility (p. 671). Planning and evaluating nursing interventions designed to promote oral health should be based on assessment of the oral cavity. Yet there are no standardized nursing assessment tools which are universally accepted and/or employed.

Maurer (1977) capsulized the dilemma by stating:

> At the present time, there is no one best rating scale for assessing the condition of the oral cavity. Further research into the existing scales would be truly beneficial in further defining objective criteria that can be used by the nurse in assessing and rating the condition of the oral cavity. (p. 675)

Those present in the literature have each been developed for studies evaluating particular oral nursing interventions with selected patient populations.

Present tools aimed at objectifying and quantifying oral status have as a common focus the visual assessment of lips, tongue, mucous membranes, gingiva, palates and teeth. Changes are rated according to moisture, color variations, and amount of tooth debris. Changes in these

structures are supported in the literature as being observable manifestations of oral hygiene parameters. Passos and Brand (1966) developed a guide for numerical rating of the mouth which has formed the basis of subsequent tools.

Studies by Van Drimmelen and Rollins (1969) and DeWalt (1975) utilized adaptations of this tool. Bruya and Madeira (1975), in a clinical article addressing prevention of stomatitis after chemotherapy, added a physical status component as well. The most recent oral assessment guide (Beck, 1979) expands on the previous instruments while including factors previously mentioned.

Each of the aforementioned studies evaluated specific protocols and have provided useful information regarding certain agents and the timing of oral hygiene nursing interventions. What has not been dealt with, however, is an evaluation of the hospitalized patient's oral status when no additional, specific nursing interventions were employed.

Oral hygiene nursing care has as its goal the prevention or diminution of detrimental mouth changes as well as enhancing patient comfort. Many patients, including the elderly, are able to perform all or part of their own oral care during hospitalization. Initial assessment and initiating a program of individualized mouth care are vital for each individual. Actual physical performance of oral hygiene measures or supporting gestures are well accepted aspects of nursing care. What may be overlooked is that

nursing responsibility does not end with the patient unable
to perform all or part of his own care. If the goal is to
enhance oral hygiene status, the nurse, as part of her
teaching role, needs to "instruct the patient in oral
hygiene and emphasize its importance" (Levine & Grayson,
1973).

Suomi and others (1971) found that a dental program
of instruction, education and frequent prophylaxis was
effective in maintaining optimal oral hygiene status.
When comparing the experimental group with a matched control
group not receiving specialized measures, a greater than
four-fold deterioration was observed in the controls
(.3 mean change from optimal oral hygiene baseline scores
in experimental group versus a mean change of 1.27 in
control group). The authors did not include statistical
testing of the significance of the difference in scores
but did conclude that their findings provided strong evi-
dence in support of programs such as the one utilized in
their study (N = 326).

Klocke and Sudduth (1969) studied the effect of one-
time toothbrushing instruction in hospitalized male patients,
aged 20 to 55. Mean difference between initial and final
plaque scores in the instructed group was 2.53 compared to
.04 in a noninstructed control group and was statistically
significant at p < .01. The investigators concluded that
teaching a correct method of toothbrushing resulted in

significantly greater plaque score reduction and was the most effective variable in improving oral hygiene status in their study sample (N = 62).

The question remains, however, whether nursing care interventions, whether they include patient education and/or the physical performance of hygiene measures, are sufficient to maintain or enhance the oral hygiene status of hospitalized patients during a time when they may well be exposed to additional stressors. The literature supports the goal of oral health for the hospitalized elderly patient and the nurse's responsibility in fostering optimal oral status. Yet studies which describe the oral hygiene status of elderly patients when they are admitted to the hospital or after a period where usual measures are employed are lacking in nursing literature. Since oral status is an integral part of the patient's total health picture, omission of studies which address this issue points to a real void which must be dealt with in nursing's scientific and pro-fessional progress.

Purpose of the Study

The purpose of this study was twofold: first, to describe the oral status of an elderly patient population upon admission to a general floor of the hospital, and second, to describe the oral status of these hospitalized patients one week after the initial assessment. Additional

data were collected on known stressors to which each patient was exposed during hospitalization.

Chapter II

METHODS

This study was designed to describe the oral hygiene
status of elderly patients within 48 hours of admission to
a general hospital floor and after one week of hospitalization.

Setting and Sample

The study was conducted at a 528 bed hospital funded
by the federal government. The facility is affiliated with
a health sciences center and offers a full range of services
to its patients, including dietary, x ray, laboratory, rehabi-
litative, surgical and medical services.

Subjects for the study included those patients admitted
to a general medical or surgical floor of the hospital during
a five-week period (January 28 to February 3, 1980) and who
met the following criteria:

1.   60 years of age or older.

2.   Admitted to a general floor of the hospital during
the time available for the study.

3.   Available for assessment of oral status during
the first 48 hours after admission to a general floor.

4.   Possessed a sufficient number of permanent teeth (4)
in order that both assessment tools employed in the study
could be utilized.

5.   Agreement of physician to allow his patient to

participate in the study.

6. Willingness of patient to participate in the study.

7. Did not meet criteria for exclusion which were undergoing head or neck irradiation, jaw or mouth surgery, psychoses, dementia, allergy to disclosing solution, and conditions affecting the oral structures which made physical performance of oral examination impossible.

Of the 252 patients, aged 60 and older, who were admitted to general medical and surgical floors of the hospital, 28 met the criteria for admission to the study. A breakdown of reasons for noninclusion is shown in Table 1 below.

Table 1

Elderly Hospitalized Patients Admitted During the Time of the Study Who Did Not Meet Criteria for Inclusion.

Reason for Exclusion (Total # of Patients = 252	Number	%
Unavailable for initial screening	22	8.7
Totally Edentulous	151	59.9
Dentulous, but fewer than 4 natural teeth	3	1.2
Medical conditions which made obtaining informed consent or performing oral assessment impossible	26	10.3
Failure to obtain patient consent	9	3.6
Failure to obtain physician consent	13	5.2
No reason for exclusion (were included in study)	28	11.1
	252	100.0

Measurement of Variables

Oral Status

Assessment of the mouth cavity as an indication of oral status was the primary concern of this study. Condition of the oral cavity was measured by two tools, the O'Leary (1972) Plaque Control Record (Appendix B) and the Bruya-Madeira (1975) Observational Assessment Guide (Appendix C).

Selection of the O'Leary Plaque Control Record, a tool utilized primarily by dental professionals, was based on the following criteria: 1) it quantified mouth changes which are influenced by oral hygiene nursing care; 2) it was feasible for the nurse to learn to use and employ effectively without lengthy specialized training in dental science; 3) ill effects to the patient were minimal (i.e., no extensive probing or invasive techniques); and 4) the tool was efficient and practical to use with a large number of patients.

Consultation with faculty at the health sciences center school of dentistry was instrumental in selection of the O'Leary Plaque Control Record as the tool which best met the criteria listed above. The Plaque Control Record is designed to measure plaque accumulation in the oral cavity. The presence of plaque on individual tooth surfaces (mesial, distal, facial, lingual) at the dentogingival junction is elucidated by disclosing solution and recorded. An index

is derived by dividing the number of plaque containing surfaces by the number of available surfaces and multiplying by 100 to achieve a percentage score. A score of 10% or less is considered to be optimal. The role of plaque in caries formation and periodontal disease is well established. Plaque can be removed by effective oral hygiene nursing care. An index, therefore, which measures this aspect of oral status should prove valuable to the nurse in initial assessment of patient's oral cavity as well as evaluation of oral hygiene nursing care. This investigator received instruction and evaluation by the Department of Dental Hygiene in order to ensure effective and accurate utilization of the tool. Interrater reliability of .98 was obtained between the investigator and dental hygienist. Additional data on reliability and validity of the Plaque Control Record are unavailable. The tool is, however, widely used and highly recommended by dental experts.

In addition to plaque control, nurses are interested in the overall condition of the oral cavity including gingival and periodontal tissues, mucous membranes, teeth, tongue, and moisture. Visual assessment of these structures should serve as a basis for planning nursing intervention. Dental tools which address many of these parameters are not feasible for the nurse to employ and must be left to dental experts. However, several tools devel-

oped by nurse researchers attempt to quantify mouth changes of interest to nurses as seen on visual inspection. One such tool is the Bruya Observational Assessment Guide (Appendix C). An adaptation from oral assessment tools developed by Passos and Brand (1966), DeWalt (1975), and VanDrimmelen and Rollins (1969), the Bruya tool provides for a more complete assessment of factors comprising oral status as well as physical factors which studies cite as being related to oral health. There are two components of the Bruya assessment tool. Physical status contains five items and includes level of consciousness, breathing habits, nutritional habits/diet, chewing ability and self care ability. The oral status component contains 12 items and includes assessment of the lips, tongue, mucous membranes, gingival tissue, teeth, saliva, taste and voice. Each of these categories is rated utilizing a descriptive guide on a scale of 1 to 3 (1 being normal and 3 being highest deviation from normal). Oral status scores range from 12 (normal) to 36 (highest deviation from normal). Similarly, a score of 5 on the physical status component is normal, and 15, the greatest deviation from normal. In a limited pilot study, three registered nurses (including the investigator) obtained a reliability coefficient of .96, utilizing a sample of 10 comatose, elderly and dialysis patients. No additional reliability and validity data for this tool are available.

Factors Affecting Oral Hygiene Status

A variety of factors may influence oral hygiene status, according to current literature. Information was recorded on the data collection sheet (Appendix D) on those of special interest to this study as well as demographic variables. Age, sex, race, formal education (years), occupation, residence prior to admission, number of teeth, presence of dentures, how often patient seeks dental care, date of last dental care, agent employed and frequency of personal oral care, reason for hospitalization, and presence of medical conditions or drug therapy which may affect oral status, and presence of oral stressors during hospitalization including self care abilities, medical or surgical treatments and changes in drug therapies which might affect oral status were recorded.

Design of the Study

This study was descriptive in design. The oral status of 28 elderly patients was evaluated on admission to the hospital, utilizing the Bruya Oral Assessment Guide and O'Leary Plaque Control Record. Of the 16 patients who remained in the hospital for one week, a repeated measure was employed, with those patients receiving a second oral evaluation identical to the initial assessment. Data was collected on demographic and other factors which might influence oral status on all patients. Stressors present during hospitalization which may have influenced second

scores of patients who remained in the hospital for one week were also recorded. No attempt was made to manipulate the described variables. A comparison of first and second scores of patients who were available for both parts of the study was made. Since the purpose of the study was to characterize the oral hygiene status of elderly patients upon admission to the hospital and one week later, without manipulation of interacting variables, an overall descriptive design with a repeated measure for that part of the sample receiving two evaluations were judged to be appropriate choices.

Procedure for Data Collection

The purpose of the study was explained to the patient and his physician following selection of individuals who met criteria for the study. A consent form (Appendix A) was signed by the patient, physician and witness.

The patient was asked questions relating to the physical status component of the Bruya Oral Assessment Guide. Possible factors relating to physical status were noted by the investigator (i.e., O_2, I+O records) and were confirmed with the patient and/or chart review.

Evaluation of the oral cavity proceeded in the following manner:

1. The patient was asked to lie down and remove his dentures, if present.

2. A protective covering was placed under the patient's

chin and the patient was asked to open his mouth.

3.   A visual inspection of the oral cavity was performed
by the investigator utilizing a penlight and tongue blade
for adequate visualization of the teeth, mucous membranes,
gingival and periodontal tissues, tongue, palate, and
quality of saliva. The tongue blade was used to gently
manipulate the oral structures for adequate visualization
of all structures.

4.   The patient was told that Trace disclosing solution
would be squirted under his tongue and this was done. The
patient was instructed to swish the solution around his
mouth and apply the solution to all tooth surfaces with his
tongue.

5.   The patient was asked to sit up, expectorate any
remaining disclosing solution and rinse once with tap water.
If the patient chose, he expectorated the disclosing solu-
tion and rinsed at a sink. If he preferred to remain in
bed, a basin and cup of water were provided so he could
complete the procedure in bed.

6.   The patient was asked to lie down once again, open
his mouth and the tooth surfaces were examined by the inves-
tigator. A penlight and mouth mirror provided adequate
visualization of the tooth surfaces. Missing teeth were
recorded first. Following this, the presence of red staining
plaque on the facial, lingual, mesial, and distal surfaces
of each tooth was recorded on the O'Leary Plaque Control

Record.

7.   Immediately following the examination, the patient was asked to brush his teeth to remove the dye.

Follwing physical assessment of the oral cavity, the patient was asked questions to obtain pertinent data and this information was recorded on the data collection sheet (Appendix D).

The patient was thanked for his cooperation in the study and asked if he would agree to participate in the study a second time if he was hospitalized a week from the present date. All patients agreed to reevaluation.

Any data not obtained from patient interview was obtained from chart review. Areas which were always confirmed by medical records were reason for hospital admission, presence of conditions which may affect oral hygiene status and drug therapy. Since all patients in the study were alert and oriented and since they were many times the only source of information on other items on the data collection sheet, their responses were judged to be representative of the data sought.

A second assessment took place one week following initial evaluation on those individuals who were in the hospital. Verbal consent was elicited, and physical assessment of the oral cavity proceeded according to the seven steps outlined above.

Thorough chart review was done on those patients who

received two assessments for the period between evaluations. Data was recorded on known and possible oral stressors which intervened during the one week period of hospitalization and included dietary changes, oxygen therapy, fluid restrictions, treatment regimens, surgery, drug therapy, and limitations in self care abilities necessitating nursing intervention for performance of oral hygiene measures (Appendix D).

Chapter III

RESULTS

The oral status of elderly hospitalized patients was
the focus of this study. All patients, aged 60 and older,
who were admitted to general medical and surgical floors
of a federally funded hospital during the time of the study
were screened. A total of 252 patients were admitted and
of those screened, 28 met the criteria for admission to
the study.

Oral status was measured by two tools, the Bruya-Madeira
Oral Assessment Guide and the O'Leary Plaque Control Record.
An evaluation of the patient's oral status was done within
48 hours of admission to the hospital. A repeat evaluation
was done one week later on those patients in the initial
sample who remained hospitalized. Sixteen of the original
28 patients were present for both evaluations and consti-
tuted the subsample. A comparison was made to determine
what, if any, changes occurred in oral status after a period
of hospitalization.

Demographic characteristics, dental and oral care
practices, and medical conditions and treatments which relate
to oral status were recorded for each subject. Additional
data was collected on factors present between initial and
final evaluations which may have influenced oral health in
the subsample during their period of hospitalization.

Description of the Sample Upon Hospital Admission

Demographic Characteristics

Subjects were characterized according to sex, age, race, years of formal education, primary occupation, and place of residence prior to hospital admission. Table A (Appendix E) shows the distribution of the sample according to the demographic characteristics.

Sex. All 28 subjects (100%) were men. The hospital setting from which the sample was drawn serves primarily a male population but females are also admitted. Screening process included both sexes but the six women screened did not fit other selection criteria (see Table A in Appendix E).

Age. Only those individuals 60 years of age and older were included in the study. In the total sample of 28, 22 (78.6%) were in their sixties, 5 (17.8%) in their seventies, and 1 (3.6%) was age 82. Mean age was 66.4 years with a range of 60 to 82 years. The subsample had a slightly lower mean age of 65.3 years and a greater percentage of these patients were in their sixties (87.5% versus 78.6% for total sample). The age distribution for the sample and subsample is shown in Table A (Appendix E).

Race. Twenty-seven (96.4%) of the participants were white and 1 (3.6%) was black. The black subject was also included in the subsample. Other races were not excluded intentionally. They were either not present during the time of the study or were excluded because they did not meet

additional selection criteria (see Table A in Appendix E).

Formal Education. Formal education was measured in terms of the years completed. Subjects varied from 4 to 17 years with a mean of 10.4 years. Table A (Appendix E) indicated that subjects (32.1%) had an eighth grade education or less, 14 (50.0%) possessed a 9-12th grade education, and five (17.9%) attended school beyond the 12th grade. A similar distribution was noted in the subsample.

Primary Occupation. The occupation of subjects was classified according to the Duncan Socioeconomic Index (Miller, 1977). Many patients included in the study were either retired or not working at present due to their medical condition. The decision for categorization was made by determining the principal occupation the subject had pursued during his working years. Individuals were distributed among all categories in addition to one extra classification of "everything" as shown in Table A (Appendix E). The two categories with the largest number of patients were craftsmen and firemen (8 patients--28.6%-- in total sample and 4 patients--25.0%--in subsample) and operatives (7 patients--25.0%--in total sample and 5 patients--31.2% in subsample).

Place of Residence Prior to Hospital Admission. Twenty-five subjects (89.3%) of the total sample lived in private dwellings, defined as homes or apartment-type residences. One patient (3.6%) was transferred from a domi-

ciliary and two (7.1%) from another hospital. The subsample showed an identical distribution except that the two patients who were transferred from other hospitals were not included (see Table A in Appendix E).

Dental and Oral Care Practices

Patient report of frequency of visits to a dentist, date of last dental care, agent(s) used and frequency of personal oral care are shown in Table B (Appendix E).

Frequency of Visits to Dentist. The majority of the sample, 20 patients (71.4%), saw a dentist for emergency care only. The remainder sought dental care more frequently with three patients (10.7%) going twice yearly, four (14.3%) seeking dental care once yearly, and one patient (3.6%) every two years. Subsample distribution was similar as shown in Table B (Appendix E).

Last Dental Care. Six patients (21.4%) had seen a dentist in 1980, 14 (50.0%) between 1976 and 1977, and eight (28.6%) had not seen a dentist later than 1975 as indicated in Table B (Appendix E). The subsample followed closely the percentage distribution of the total sample.

Agent Employed for Personal Oral Care. Over half of the subjects in both the sample (19 patients, 67.9%) and subsample (11 patients, 68.7%) utilized a toothbrush and dentifrice for oral care. Dental floss was used in addition by five patients (17.9%) in the total sample and three patients (18.7%) in the subsample. The remaining

patients used either mouthwash or nothing as shown in Table B (Appendix E).

Frequency of Personal Oral Care. Twenty subjects (71.4%) in the total sample performed oral care at least once daily utilizing a toothbrush and/or floss. Oral care was performed by four patients (14.3%) less than once daily and four (14.3%) reported that they never brushed or flossed. Of the subsample, 87.5% (14 patients) used a toothbrush and/or floss at least once daily while 12.5% (2 patients) stated they never performed these oral care measures (see Table B in Appendix E).

Presence of Natural Teeth and/or Dentures

The number of natural teeth was observed and recorded. Presence of full or partial dentures was obtained by patient report.

Teeth. One criterion for admission to the study was the possession of at least four natural teeth which could be rated according to the O'Leary Plaque Control Record. Mean number of teeth for the total sample was 19.2 with a range of 4 to 29. The subsample population had from 6 to 29 teeth with a mean of 20.6. None of the subjects possessed all 32 natural teeth.

Dentures. Fifteen patients (53.6%) in the total sample and 10 patients (62.5%) in the subsample did not have dentures. Six (21.4%) had removable partial plates and seven (25.0%) possessed full upper dentures in the total sample. Two

patients (12.5%) in the subsample had partials and four (25.0%) had full upper plates. No patients had full lower dentures.

Medical Problems and Treatments of Special Interest

Reason for Hospitalization. Subjects were hospital-ized for a variety of reasons as shown in Table C (Appen-dix E) and included evaluation of coronary artery disease, chronic obstructive pulmonary disease, lung cancer, surgical correction of cataracts, pneumonitis, arteriosclerotic peripheral vascular disease, possible rejection of renal transplant, thrombophlebitis, low back pain, vertigo due to Meniere's Disease, prosthetic hip replacement necessitated by degenerative joint disease, newly diagnosed diabetes, surgical removal of skin cancer, prostatectomy, alcoholic liver disease, chronic lymphocytic leukemia, congestive heart failure and gastrointestinal evaluation. The single category responsible for the greatest number of admissions in both the sample and subsample was coronary artery disease. Admitted for evaluation of this condition was 28.6% (8 patients) of the total sample and 25.0% (4 patients). A complete distribution of subjects among the various cate-gories is presented in Table C (Appendix E).

Presence of Conditions Which May Affect Oral Status. Fifty percent of both the sample and subsample had one or more conditions identified in the literature as capable of negatively influencing oral status. These conditions

are renal disease, metastatic malignancy, diabetes, nutri-
tional defects, anemia, leukemia, alcoholism, oral lesions,
calculus and periodontal disease. Conditions and number
of patients in each category are summarized in Table D
(Appendix E).

Medications Which May Influence Oral Status. Seven-
teen patients (60.7%) in the total sample and 11 (68.8%)
of the subsample were currently taking drugs known to
affect oral status as demonstrated in Table E (Appendix E).
Diuretics were the single class of medicines taken by the
largest number of patients in both groups (11 patients--
39.3%--in the total sample; seven patients--43.8%--in
the subsample. Digoxin was the specific drug taken by
the greatest number of patients in the total sample (eight
patients, 28.6%) whereas it was salicylates in the subsample
(five patients, 31.3%). The largest number of target
drugs taken by any one patient in either group was four
(see Table E in Appendix E).

Oral Status Upon Hospital Admission

Bruya-Madeira Oral Assessment Guide. A total score was
computed for each of 28 patients and is shown on Table F
(Appendix E). A score of 17 is considered normal, denoting
no oral problems. Any score above 17 denotes the presence
of oral problems with 51 the highest score possible with
this tool. Scores for the total sample ranged from 17 to
23 and distribution is shown in Figure 1. Nine patients
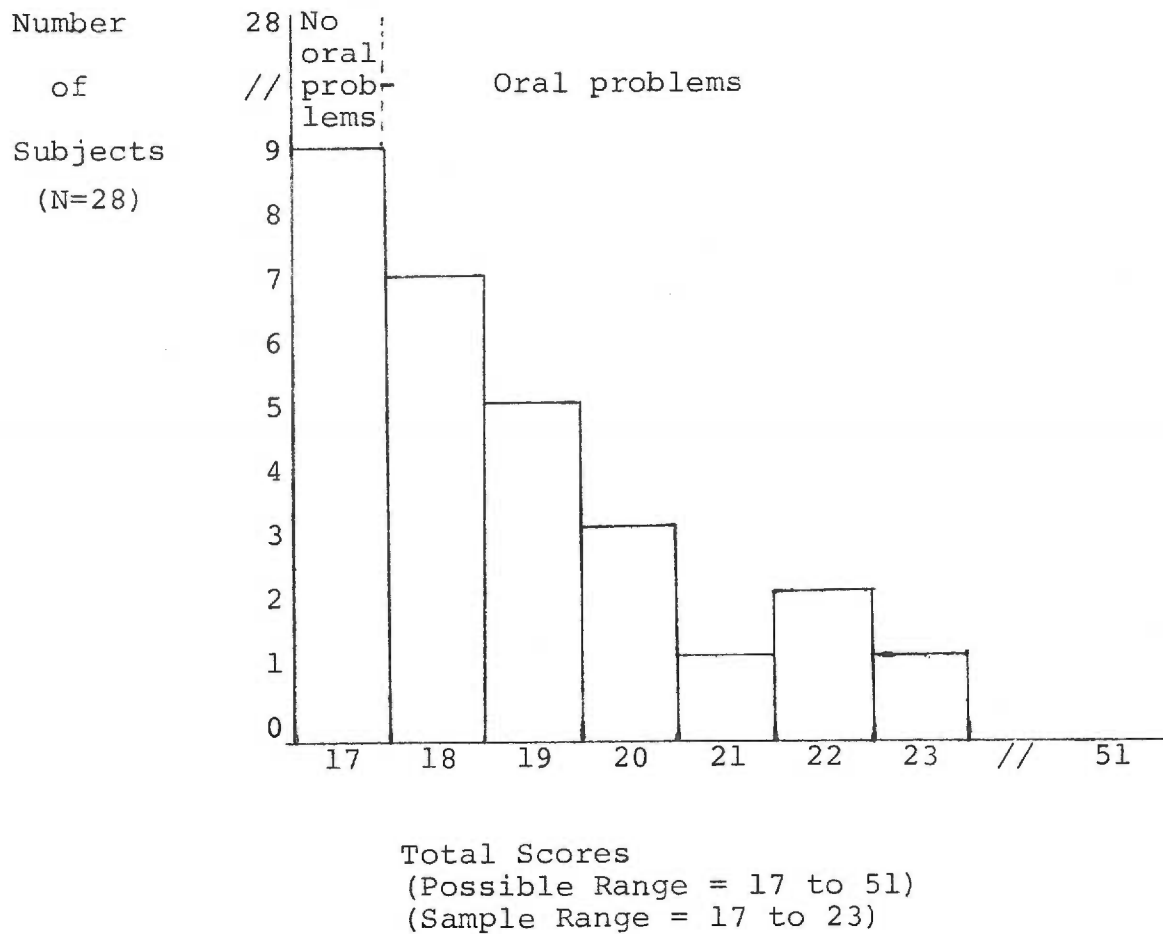
Figure 1. Distribution of Sample Subjects on Hospital
Admission According to Bruya-Madeira Oral
Assessment Guide Total Scores

(32.1%) had a normal score of 17 while 19 patients (67.9%)
had oral problems, demonstrated by scores in excess of
this value.

Patient scores for each section of the oral assessment
guide were examined to determine where deviations from
normal occurred. A summary of this data is presented in
Table G (Appendix E). All patients received a normal score
of 1 in the following sections: level of consciousness,
self-care ability, lip color, tongue color and moisture,
saliva, and voice.

A score of 2 or 3 reflected observable manifestations
of oral problems. Areas where patients received abnormal
scores under the physical status component include the
following. One patient (3.6%) was receiving oxygen via
nasal prongs and received a score of 2. Three patients
(10.7%) ingested a nondetergent diet prior to hospitaliza-
tion and received a score of 2. Chewing ability was com-
promised in 12 patients (42.8%), 10 (35.7%) who received
a score of 2 and two (7.1%), a score of 3.

An analysis of the oral status scores showed abnormal
values in several categories. Three patients (10.7%) had
rough lips and received a score of 2 on lip texture.
Assessment of lip moisture showed one patient (3.6%) with
dry, cracked lips, necessitating a score of 3. Tongue
assessment showed seven patients (25.0%) who received a
score of 2 and one subject (3.6%) who was graded 3 on

texture. Membrane scores were normal with the exception of one patient (3.6%) possessing a pale palate necessitating a score of 2. Six patients (21.4%) showed pink to red, shiny edematous gingival tissue and were scored 2. One individual (3.6%) complained of a change in taste sensation and was given a 2.

O'Leary Plaque Control Record. A percentage plaque score was derived by dividing the number of tooth surface with plaque by the total number of surfaces and multiplying by 100. Table F (Appendix E) shows plaque scores for each patient. Scores ranged from 5 to 93% with a mean of 52.1. Distribution of plaque scores is shown in Figure 2. Only one patient (3.6%) scored in the acceptable range of 10%. Twenty-seven (96.4%) of 28 subjects had oral cavity problems upon hospital admission identified by the plaque control record.

Comparison of Expected and Observed Oral Status. A previous study (Council on Hospital Dental Service, 1966) demonstrated that 80% of the patients admitted to a hospital had oral cavity problems. Nineteen (67.9%) of the patients in this study were shown to have oral cavity problems demonstrated by the Bruya-Madeira Oral Assessment Guide. Twenty-seven (96.4%) patients were shown to have oral cavity problems by the O'Leary Plaque Control Record. Chi square was used to compare the expected and observed values. There were no significant differences at p = .05 (df = 1) between observed
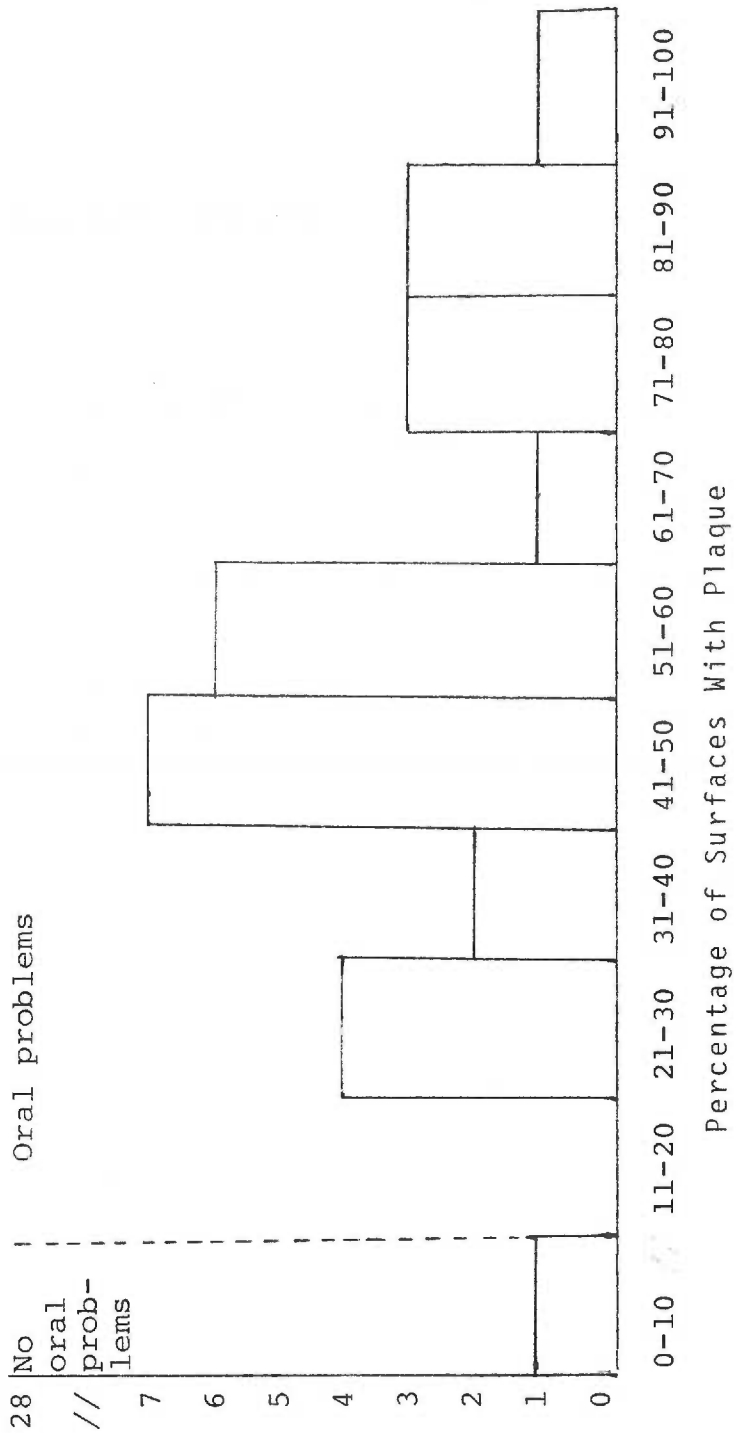
Figure 2. Distribution of Sample Subjects on Hospital Admission According to the O'Leary Plaque Control Record Scores

values for either tool and expected values based on the literature.

Description of the Subsample Upon Admission and After One Week of Hospitalization

Sixteen of the original 28 patients remained hospitalized one week after initial assessment and received a second evaluation. These patients constituted the subsample and a comparison was made between initial and final evaluations to determine if there were any changes in oral status. Distribution of the subsample upon hospital admission according to demographic characteristics (Table A), dental and oral care practices (Table B), reason for hospitalization (Table C), conditions (Table D) and drug therapy (Table E) which may affect oral status are similar to that seen in the total population and are reported in Appendix E.

Patients may be exposed to additional factors during the course of hospitalization which may influence oral status. The presence or absence of oral stressors identified by the literature were recorded on each patient in the subsample during the time between initial and final evaluations. Table H (Appendix E) presents a summary of the findings for each patient.

Several factors which may cause detrimental oral changes were alleviated during the week between initial and final assessments. The single patient receiving oxygen at time of initial assessment had the oxygen stopped immediately

after the first evaluation for the remainder of hospitaliza-
tion. All patients were placed on detergent diets which
allowed the ingestion of high fiber foods. Whether these
foods were actually eaten by the participants was not
determined.

Patients were NPO for short periods, three for less
than half a day and one for one day. Those who were NPO
for these short periods were well hydrated both before
and after the assessment. Diminished fluid intake was not
a stressor of impact in the sample.

Medication changes occurred during the week between
evaluations. Three patients (18.8%) who were presently
taking drugs implicated in detrimental oral changes received
increased amounts during the week. Four patients (25.0%)
had a decrease in amounts. Five patients (31.3%) began
taking additional medications which may affect oral status
and four subjects (25.0%) received a one time dose of drugs
under question.

Only one patient required bed rest during the week
between assessment. Recovery from total hip replacement
necessitated nursing intervention of mouth care materials
brought to the bedside during four days when the patient
remained in bed. Another patient, because of diminished
vision required aid in ambulating and consequently to reach
the sink to perform his own oral hygiene. All patients were
capable of actual performance of oral hygiene measures

themselves. Of the two patients who required nursing inter-
vention, the one with vision impairment showed an improve-
ment of 17% on plaque scores and the other on bedrest showed
a worsening of 13%. No trend can thus be appreciated for
those two patients requiring nursing aid.

Comparison of Oral Status Upon Admission and One Week Later

Table F (Appendix E) presents total scores of each
patient in the study. The 16 subjects constituting the
subsample are indicated by asterisks and both initial and
final scores recorded for this group.

Bruya-Madeira Oral Assessment Guide. Seven (43.8%) of
the 16 patients received an initial score of 17 for the
Bruya-Madeira Oral Assessment Guide which denotes absence
of oral problems. Oral problems were observed in the
remaining nine (56.2%) subjects. Four (25.0%) had scores
of 18, two (12.5%) a score of 19, and one (6.3%) each a
score of 20, 21, and 23.

Comparison of initial and final scores showed that
five patients (31.3%) received a higher score at the second
evaluation, indicating worsening of oral status. Three
patients (18.7%) improved, demonstrated by a lower score
and eight patients (50.0%) stayed the same. The Wilcoxan
Matched-Paired Signed Ranks test was employed to test the
statistical significance of the changes observed. Computed
z value of 12.0 demonstrated that there were no signficant

differences between initial and final scores at the p $\leq$ .05 level.

O'Leary Plaque Control Record. Individual plaque scores for the subsample (denoted by asterisks) on initial and final evaluation are shown in Table G (Appendix E). Mean score on hospital admission was 49.5% with a range of 5-93%. Scores ranged from 12 to 91% on second evaluation, with a mean of 46.2%. A T test was employed to determine the significance of the lower (i.e., improved) mean score obtained on final assessment. A computed value of 1.64 (df = 15) demonstrated no statistically significant differences between initial and final mean scores.

Summary of Findings

The oral status of 28 male patients, aged 60 and older, was evaluated within 48 hours of hospital admission. As demonstrated by scores on the Bruya-Madeira Observational Assessment Guide, 67.9% of the sample had oral cavity problems while 96.4% were shown to have oral problems when measured by the O'Leary Plaque Control Record. These figures were not significantly different from those reported by the Council on Hospital Dental Service in their survey of oral problems in patients admitted to the hospital during an eight-month period.

A second evaluation was conducted on those patients in the original sample who remained hospitalized one week after initial assessment. Sixteen of the original 28

patients constituted the subsample. Changes in oral status were noted from initial to final assessment. These changes were not statistically significant, however, demonstrating that oral status did not significantly change in the subsample after a one-week period of hospitalization.

Description of the sample according to demographic characteristics, oral and dental care practices, and medical conditions and treatments of interest to oral health were included.

Chapter IV

DISCUSSION

The oral status of 28 elderly hospitalized patients was evaluated within 48 hours of admission. A second evaluation was performed on the 16 patients remaining in the hospital for one week. Oral status was measured by the Bruya-Madeira Oral Assessment Guide and the O'Leary Plaque Control Record. Data was collected on demographic characteristics, dental and oral care practices and medical conditions and treatments known to affect oral status, and the presence of oral stressors during hospitalization.

Oral Status Upon Hospital Admission

The Bruya-Madeira Oral Assessment Guide elicited the presence of oral problems in 67.9% of the sample and 96.4% were shown to have oral problems as measured by the O'Leary Plaque Control Record. These figures are not significantly different from the 80% value obtained in a survey of all patients admitted to a hospital over an eight-month period (Council on Hospital Dental Service, 1966) and supports the observation that a large number of patients enter the hospital with compromised oral status.

The degree of oral problems detected by the two tools was somewhat different. Total scores on the Bruya-Madeira tool were clustered on the lower end of the abnormal range.

Out of possible scores of 17 to 51, 17 being normal and 51 denoting the highest deviation from normal, the sample scores ranged from 17 to 23. Nine patients received a normal score of 17. Of those with abnormal scores, 63% had values only one to two increments above normal, with the highest score for the sample only six increments beyond the normal value of 17. The fact that most patients did show some abnormal changes cannot be overlooked. Attempting to relate the small changes which did occur to other variables does not seem appropriate.

The plaque scores, on the other hand, demonstrated a far greater deviation from that considered as optimal. Only one patient had a plaque score less than 10%, and 96.4% of the sample had plaque scores greater than 10%. A high mean score of 52.1% indicated that this elderly population had plaque on greater than half the total tooth surfaces. This is an important finding for several reasons. Plaque formation is the initial process in the chain of events leading to gingivitis and periodontal disease. Plaque can be removed by thorough daily brushing and is therefore under the control of the patient and/or nurse.

Even though oral care with a toothbrush was reportedly performed daily by the majority (71.4%) of participants, it evidently was not sufficient to reduce plaque accumulation to acceptable levels. This may be due, in part, to lack of regular dental care. Appropriate toothbrushing

instruction usually occurs in a dental office during routine oral prophylaxis, yet most patients (71.4%) in this study visited a dentist for emergency measures only. It may be possible, therefore, that these patients have never been taught the proper way to perform oral care in order to reduce plaque formation. Klocke and Sudduth (1976) found that even a one-time instruction in proper toothbrushing methods resulted in significant plaque reduction over a short period of time.

Changes in Oral Status Between Initial Assessment and One Week Later

The subsample population receiving two assessments reflected the total sample in demographic characteristics, prior oral and dental care, and the presence of medical conditions and treatments which may affect oral status. The initial oral assessment and plaque scores were also similar to those seen in the total sample.

Scores on the final assessment varied minimally from initial assessment in the subsample population. The changes observed for the Bruya-Madeira tool were not significant when evaluated by the Wilcoxan Matched-Pairs Signed Rank test. A T test showed no significant differences between initial and final plaque scores as well. It was expected, based on predictions by experts in the field, that oral status would deteriorate during hospitalization. The findings of this study did not confirm that expectation.

Although oral status did not deteriorate, it also did not significantly improve during the course of hospitalization. This is an unfortunate situation in view of the large number of individuals in this study who entered the hospital with identified oral problems. If improvement of health is a goal of professionals, then oral status must be included as an integral part of this goal.

Oral Stressors

Several patients had one or more oral stressors present on initial assessment. Yet none of the patients had as many present as those studied by DeWalt and Haines (1969). Many of the stressors addressed in the literature have, as their detrimental influence, the dehydration of the mouth cavity. The oral status component of the Bruya-Madeira Oral Assessment Guide addresses many changes seen as a consequence of inadequate hydration of the oral tissues. Since none of the patients in this study suffered from significant dehydration, this may account for the oral scores approaching normal.

Oral stressors present on initial assessment were, for the most part, similar during hospitalization. Diet improved for one patient, and the single patient receiving oxygen therapy on first assessment did not for the remainder of hospitalization. Several other potential stressors were present during initial assessment and changed during hospitalization. Medical conditions and drug therapy may both have had an

influence on oral status scores. Since none of the conditions or medications interfered with self-care tooth brushing, influence on plaque scores should be negligible. Even with alterations in medications, changes seen on the Bruya-Madeira Oral Assessment Guide were so small as to be insignificant.

Additional Observations

Several observations were made during the process of data collection and deserve attention. Criteria for sample selection necessitated exclusion of a large number of elderly patients admitted to the hospital during the time of the study. Of particular significance was exclusion of those patients who were edentulous. Price (1979) notes that approximately 50% of individuals aged 65 and older have no natural teeth. Sixty percent of the 252 patients screened for this study were edentulous, a higher figure than that seen in the general population. Patients possessing less than four natural teeth were not included because both tools were employed with all subjects. The oral assessment guide provides for evaluation of edentulous patients but the plaque scoring index requires teeth in order to be utilized. Since such a high percentage of elderly indivuals are lacking teeth, provisions for routine oral assessment must include means of evaluating both edentulous and dentulous patients.

Strengths and limitations of the instruments chosen

for assessment of oral status need to be mentioned. One distinct benefit of the tools was that they were neither time-consuming nor difficult to learn to use or employ with groups of patients. The advantage of utilizing both tools together is that they address different aspects of oral status. The Bruya-Madeira Oral Assessment Guide provides an overall screening of multiple factors known to influence oral status as well as oral assessment parameters of the various mouth structures. The O'Leary Plaque Control Record looks more carefully at one aspect of oral status, that of plaque formation. Plaque is known to be the first manifestation of a long series of steps which may lead to gingivitis and periodontal disease. It is also that step which is most likely to be reversed by oral care measures which can be performed by the patient and/or nurse. Both tools quantify mouth changes. The advantage of assigning numerical ratings to oral changes is that numbers can be summed, averaged and subjected to various other analyses whereas descriptions cannot.

Several problems were noted, however, while using the instruments. The oral assessment guide provides descriptions of oral changes which are then given a numerical value. In most instances, assignment to a category was straightforward. Difficulties arose, however, when observations were not as clear-cut or did not fit the descriptive categories of the tool. Of particular note were the

assessment of chewing ability and the evaluation of certain oral structures. A number of patients did not have normal teeth and chewing ability, yet were not readily assigned to the two abnormal descriptive categories for chewing ability. For instance, a patient with dental disease in terms of calculus and periodontal disease may still have enough natural teeth to have near normal chewing ability. The decision to assign patients to a particular category when difficulties in classifying according to the descriptive criteria arose was based on the amount of interference with chewing ability. Several areas on the oral status exam were likewise difficult to score. One patient had a moist, pale palate for which there is no category. Tooth debris was difficult to score in that visualization of the oral cavity was not always adequate to assess the amount of debris present. Other investigators utilized explorers as well as visual observation to determine amount of debris (Beck, 1979; Greene & Vermillion, 1960). A final feature of the tool which may pose a certain limitation is the weighting of certain oral structures. Lips and tongue have three components each to be scored separately, whereas gingivae, mucous membranes, teeth, and other oral structures possess only one category each for scoring.

The plaque index chosen for this study easily detected the presence and absence of plaque on the tooth surfaces of interest. One limitation of this particular tool, however,

is that the amount of tooth surface covered by plaque is not addressed. In other words, a patient who has plaque on a single tooth surface only around the gum line would be scored the same as someone who has plaque covering the entire surface in question.

In spite of the limitations of the two tools, it was felt that they represented an acceptable means of assessing many oral changes of interest to the nurse as well as providing a means for observations to be compared among patients and groups.

Limitations of the Study

There were a number of limitations present in this study, including the following:

1. The sample selection procedures necessitated exclusion of a large percentage of the elderly population because of lack of teeth.

2. The small sample size and method of selection makes the generalization of these findings to other populations invalid.

3. The limitations of the tools may have influenced the results.

4. Much of the data collection relied on patient subjective reports than more objective means.

5. Factors which may have influenced oral status during hospitalization were determined solely by chart audit.

Implications for Nursing

The findings of this study have several implications for nursing. Even though the patient population was small, it did affirm assertions in the literature that elderly patients admitted to the hospital have some degree of compromised oral status. Since nurses claim as their responsibility the oral care of the hospitalized patient, this study does, in fact, document a group which may need special attention.

Oral status did not decline in these patients, who were alert and oriented and able, for the most part, to perform oral self-care measures when hospitalized. The effects on the oral cavity of elderly patients lacking in self-care abilities or disoriented needs to be examined.

The two tools used appear to be feasible and effective measurements of oral status for nursing. Although they possess some limitations, the tools do address the areas of the oral cavity and physical status parameters which must be evaluated for a comprehensive oral nursing assessment.

The most significant finding, however, was the high plaque scores on both initial and final assessments. Plaque is the precursor to more serious oro-dental problems and plaque can be controlled and virtually eliminated by proper toothbrushing procedures. The group included in this study would provide an ideal population for patient instruction in better oral care methods. Nurses realize that they must

perform mouth care for someone unable to do this himself, but often lose sight of the potential for improving oral status by teaching other hospitalized patients. It may be argued that proper toothbrushing instruction more appropriately belongs with dental professionals and this may be the case if one can assure that the patient will seek prophylactic dental care. When almost three-fourths of the patients in this study have sought dental care for emergency purposes only, it is obvious that proper plaque removal and toothbrushing instruction was low on the list of priorities. Nurses are in an ideal position, then, to offer this instruction when an individual is hospitalized. Showing the patient how to correctly brush his teeth and the utilization of disclosing tablets to delineate plaque, should take no more than 15 minutes. Reinforcement of prior teaching could be accomplished daily when other nursing measures are being performed. The import to patients like those included in the present study would be immense--preservation of remaining function, prevention of more serious oral changes, and enhancement of comfort may all be possible with appropriate teaching and nursing interventions.

Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

FOR FURTHER STUDY

Summary of the Findings

The oral status of elderly patients (aged 60 and older) was evaluated upon admission and after one week of hospitalization. A sample of 28 patients were included in an initial assessment performed within 48 hours of admission to general medical and surgical floors. Sixteen patients constituted a subsample as they remained hospitalized for one week and received a second assessment. The sample was described according to demographic variables, dental and oral care practices and medical conditions and treatments of special interest.

Oral status was measured by the Bruya-Madeira Oral Assessment Guide and the O'Leary Plaque Control Record. Scores ranged from 17 (normal) to 23 for the Bruya-Madeira tool on initial assessment. Nineteen patients (67.9%) had scores greater than 17, indicating oral cavity problems. O'Leary scores showed a range of 5 to 93% with a mean score of 52.1%, and 96.4% had scores reflective of oral problems. Observed values were not significantly different from those expected based on the literature.

Comparison of initial and final scores for the 16

patients comprising the subsample demonstrated that there was no significant change in oral status over the one-week course of hospitalization. The primary additional oral stressor present during hospitalization was drug therapy known to affect oral status.

Conclusions

A high percentage of elderly patients in this study had oral cavity problems upon admission to the hospital. This finding is consistent with the limited literature available and points to the need for effective nursing intervention in order to improve or, at the very least, maintain oral health.

The oral status of the subsample did not significantly change over the course of hospitalization. This is somewhat unexpected, and may be due to several factors. All patients in the study were able to perform their own oral care during hospitalization and may account for the stability of scores. All patients were well hydrated throughout the study and had a minimal number of oral stressors. This too may be responsible for the maintenance of initial oral status during hospitalization.

Even though patients' oral status did not worsen during hospitalization, neither did it significantly improve. Because nursing intervention in the form of teaching proper oral care measures has been demonstrated to significantly improve oral status during hospitalization and because this

study and others have shown a high degree of oral problems present in patients upon hospitalization, nurses need to address more aggressively this aspect of patient care. Adequate assessment, appropriate intervention, and evaluation are nursing responsibilities which apply to oral care as well as to other aspects of patient management.

Recommendations for Further Study

A number of areas which deserve further study became evident during the course of this investigation and include the following:

1. An identical study which utilizes a larger patient population would be useful to determine if the findings would be similar with a larger group.

2. Further testing of the two tools used in this study to establish reliability and validity.

3. A study designed to assess the oral status of both dentulous and edentulous elderly patients is needed to determine what, if any, differences in oral problems are noted with the separate groups.

4. Additional studies aimed at assessing specific oral hygiene nursing interventions for elderly hospitalized patients would provide useful information which could be utilized when planning actual patient care.

5. Studies are needed which deal with all aspects of oral nursing care. At present, they are few and the gap between clinical practice based on custom and personal

preference rather than on objective scientific data must be closed if nursing is to enhance its professional accountability.

REFERENCES

Beck, S. Impact of a systematic oral care prtocol on stom-
    atitis after chemotherapy. Cancer Nursing, 1979, 6, 185-199.

Bhaskar, S. N. Oral lesions in the aged population. Geriatrics,
    1968, 23, 137-149.

Block, P. L. Dental health in hospitalized patients. Ameri-
    can Journal of Nursing, 1976, 76, 1162-1164.

Bonner, C. D. Medical care and rehabilitation of the aged
    and chronically ill. Boston: Little, Brown & Co., 1974.

Bruya, M. A., & Madeira, N. P. Stomatitis after chemotherapy.
    American Journal of Nursing, 1975, 75, 1349-1352.

Council on Hospital Dental Service. Oral evaluation of hos-
    pitalized patients. Journal of the American Dental
    Association, 1966, 72, 911-912.

DeWalt, E. M. Effect of timed hygienic measures on oral
    mucosa in a group of elderly subjects. Nursing Research,
    1975, 24, 104-108.

DeWalt, E. M., & Haines, A. K. The effects of specified
    stressors on health oral mucosa. Nursing Research, 1969,
    18, 22-27.

Dyer, E. D., Monson, M. A., & Cope, M. J. Dental health in
    adults. American Journal of Nursing, 1976, 76, 1156-
    1159.

Epstein, S. Dental care and the aging. In Perspectives on
    Aging. Natl. Council on Aging, 1976.

Ettinger, R. L., & Manderson, R. D. Dental care of the

elderly. Nursing Digest, 1976, 71, 78-79.

Food and Nutrition Board. Recommended dietary allowances, 8th

revised edition. Washington, D.C.: National Academy

of Sciences, 1974.

Greene, J. C., & Vermillion, J. R. Oral hygiene index: A

method for classifying oral hygiene status. Journal

of the American Dental Association, 1960, 60, 172-179.

Greene, J. C., & Vermillion, J. R. The simplified oral

hygiene index. Journal of the American Dental Associa-

tion, 1964, 68, 25-31.

Hayward, J. R. In Physical diagnosis: A physiologic approach

to the clinical examination. R. D. Judge & G. D. Zuidema

(Eds.). Boston: Little, Brown & Co., 1968.

Hector, W. Care of the teeth: The nurse's view. Nursing

Times, 1970, 66, 1611.

Kart, C. S., Metress, E. S., & Metress, J. F. Aging and health:

Biologic and social perspectives. Menlo Park, Calif.:

Addison-Wesley Publ. Co., 1978.

Kerr, D. A., Ash, M. M., & Millard, H. D. Oral diagnosis

(5th ed.). St. Louis: Mosby, 1978.

Klocke, J. M., & Sudduth, A. G. Oral hygiene instruction

and plaque formation during hospitalization. Nursing

Research, 1969, 18, 124-130.

Krehl, W. A. The influence of nutritional environment on aging.

Geriatrics, 1974, 29, 65-76.

Levine, P., & Grayson, B. H. Safeguarding your patient against periodontal disease. Registered Nurse, 1973, 36, 38-41.

Lovelock, D. J. Oral hygiene for patients in hospital. Nursing Mirror, 1973, 137, 39-42.

MacLennan, D. Oral hygiene in hospital. Nursing Times, 1974, 70, 471-472.

MacPhee, T., & Cowley, G. Essentials of periodontology and periodontics (2nd ed.). Oxford: Blackwell Scientific Publications, 1975.

Maurer, J. Providing optimal oral health. Nursing Clinics of North America, 1977, 12, 671-685.

McPhetridge, L. M. Relationship of patients' responses to nursing history questions and selected factors. Preliminary study. Nursing Research, 1973, 22, 310-320.

Miller, D. C. Handbook of research design and social measurement (3rd ed.). New York: David McCay Co., Inc., 1977.

O'Leary, T. J., Drake, R. B., & Naylor, J. E. The Plaque Control Record. Journal of Periodontology, 1972, 43, 38.

Passos, J. Y., & Brand, L. M. Effects of agents used for oral hygiene. Nursing Research, 1966, 15, 196-202.

Pope, W., Reitz, M., & Patrick, M. A study of oral hygiene in the geriatric patient. Journal of Nursing Studies, 1975, 12, 65-72.

Price, J. H. Oral Health care for the geriatric patient. Journal of Gerontological Nursing, 1979, 5, 25-29.

Redman, B. K., & Redman, R. S. Oral care of the critically

ill patient. In B. S. Bergersen, et al. (Eds.),

  Current concepts in clinical nursing. St. Louis:

  C. V. Mosby Co., 1967.

Reitz, M. H. A study of oral hygiene and the health of

  gingiva in geriatric patients. Unpublished masters

  thesis. Portland: UOHSC, 1971.

Reitz, M., & Pope, W. Mouth care. American Journal of Nursing,

  1973, 73, 1728-1730.

Rice, D. H. Salivary gland physiology. Otolaryngology

  Clinics of North America, 1977, 10, 273-285.

Ross, W. L., Johnson, R. H., & Hayes, R. L. Examination of

  the mouth. General Practitioner, 1967, 36, 78-86.

Schrieber, F. C. Dental care for long-term patients. Ameri-

  can Journal of Nursing, 1964, 64, 84-87.

Shank, R. E. Nutritional characteristics of the elderly--

  an overview. In M. Rockstein & M. L. Sussman (Eds.)

  Nutrition, longevity, and aging. New York: Academic

  Press, Inc., 1976.

Ship, I. I., & Galili, D. A. Systemic significance of mouth

  ulcers. Postgraduate Medicine, 1971, 49, 67-72.

Shklar, G., & McCarthy, P. L. The oral manifestations of

  systemic disease. Woburn, Maine: Butterworth Publishers

  Inc., 1976.

Steele, P. Dimensions of dental hygiene, Philadelphia:

  Lea & Febiger, 1966.

Suomi, J. D., Greene, J. C., Vermillion, J. R., Doyle, J.,

  Chang, J. J., & Leatherwood, E. C. The effect of con-

  trolled oral hygiene procedures on the progression of

  periodontal disease in adults. Results after third

and final year. Journal of Periodontology, 1971, 42, 152-160.

U.S. Dept. HEW. Working with older people. DHEW Publ. No. HSM 72-6006. Wash. D.C.: U.S. Govt. Printing Office, 1972.

Van Drimmelen, J., & Rollins, H. F. Evaluation of a commonly used oral hygiene agent. Nursing Research, 1969, 18, 327-332.

Young, C. M. Nutritional counseling for better health. Geriatrics, 1974, 29, 83-91.

APPENDIX A

Informed Consent Form

INFORMED CONSENT
Portland Veterans Administration
Medical Center
Portland, Oregon

Principal Investigator: Jessie F. Zavin

   I, _____, agree
to serve as a subject in the investigation named, "Assess-
ment of Oral Hygiene Status of Elderly Patients Upon Admis-
sion and During Hospitalization,"* by Jessie F. Zavin, R.N.,
under the supervision of Sharon Clark, R.N. and Larry B.
Thompson, D.D.S. This study aims at determining the oral
hygiene status of an elderly patient population at the time
of admission and one week later.

   First a nurse will look in my mouth and evaluate its
condition. A penlight, tongue blade and mouth mirror will
be used. This will take approximately five minutes. I will
then swish a red dye solution (FD&C Red #3) in my mouth,
rinse and again have my mouth evaluated by the nurse. This
will take approximately ten minutes. After the evaluation
is finished, I will brush my teeth to remove the remaining
dye. If I remain in the hospital for an additional week,
I will go through this procedure a second time, one week
following initial assessment.

   The benefit to me is that I will receive an evaluation
of my mouth and if a problem is found, I will be notified
so that I can get help. I could possibly have a sensitivity
reaction to the dye or get some dye on my clothes. If I
have a reaction to the dye, my personal physician will be
told immediately and I will be treated. If I get dye on my
clothes, the clothes will be put in cold water unless that
fabric cannot be put in water (such as wool). There will be
no cost to me for the red dye solution or toothbrush.

   The information obtained will be kept confidential. My
name will not appear on the records and anonymity will be
assured by the use of code numbers.

   Virginia Hansen, D.D.S., has offered to answer any ques-
tions about participation in this study. I understand that
I may refuse to participate or withdraw from this study at
any time without affecting my relationship with, or treat-
ment at the Portland VA Hospital.

   In the event of physical injury resulting from the
study, medical care and treatment will be available at this
institution. For eligible veterans, compensation (damages)
may be payable under 38USC 351 or, in some circumstances,

under the Federal Tort Claims Act. For non-eligible veterans, and non-veterans, compensation would be limited to situations where negligence occurred and would be controlled by the provisions of the Federal Tort Claims Act. For clarification of these laws, contact the District Counsel at (213) 824-7379.

It is not the policy of the Department of Health, Education & Welfare, or any other agency funding the research project in which you are participating, to compensate or provide medical treatment for human subjects in the event the research results in physical injury. However, as a veteran you would be entitled to medical care at this or any other veteran's facility. If you suffer any injury from the research project, compensation would be available to you only if you establish that the injury occurred through the fault of the Portland VA Hospital, its officers, or its employees.

I have read and understand the foregoing and agree to participate in this study.

_____   _____

SUBJECT'S SIGNATURE   DATE

_____

SUBJECT'S SOCIAL SECURITY NUMBER

_____   _____

RESPONSIBLE PARTY   DATE
(IF PATIENT IS UNABLE TO CONSENT)

_____   _____

AUDITOR/WITNESS   DATE

_____   _____

PHYSICIAN/DENTIST   DATE

*The thesis title was changed to "A Description of the Status of the Oral Cavity of Elderly Patients at Admission and After One Week of Hospitalization" at a later date in order to be more descriptive of the study.

APPENDIX B

O'Leary Plaque Control Record

O'Leary Plaque Control Record

Identification number: _____

Date: _____

```
  1    2    3    4    5     6    7    8    9   10   11   12   13   14   15   16
 (X)  (X)  (X)  (X)  (X)   (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)
─────────────────────────────────────────────────────────────────────────────
 (X)  (X)  (X)  (X)  (X)   (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)  (X)
 32   31   30   29   28    27   26   25   24   23   22   21   20   19   18   17
```

1) Mark out all missing teeth.

2) Record in red (-) all surfaces with plaque present.

3) $\dfrac{\text{\# surfaces with plaque}}{\text{\# surfaces present}} \times 100 = \text{score}$

APPENDIX C

Bruya-Madeira Oral Observational Guide

GUIDE FOR ASSESSMENT OF THE MOUTH

Variables	Numerical and Descriptive Rating		
	3	2	1
1. Physical Status			
a. level of consciousness	nonresponsive unconscious	apathetic, occasionally disoriented	oriented to time, place and person responds appropriately
b. breathing habits	respirator, tracheostomy or endotracheal tube	mouth breather nasal O_2/mask O_2	nose and mouth breathing without mechanical assistance
c. nutritional habits/diet	NPO, dehydrated gastrostomy, jejunostomy, IV lines	nondetergent diet variable or limited fluid intake	normal fluid and detergent diet
d. chewing ability	impairment in jaw separation, edentulous-without dentures, overt dental problems, oral disease	edentulous with poorly fitting dentures, limited biting strength	normal teeth and chewing ability
e. self-care ability	total dependence on others	feeds self, performs mouth care with help	totally responsible for self-care
2. Oral Cavity			
a. lips			
1) texture	cracked, bleeding	rough	smooth, soft
2) color	red, inflamed, some bleeding	some reddened areas	pink
3) moisture	dry, cracked	blistered	moist
b. tongue			
1) texture	coated at base, engorged, deeply grooved, thicker than normal	vallate papillae and lingual groove prominent	firm, without fissures or prominent papillae
2) color	very red tip, sides blistered	pink with reddened areas	pink
3) moisture	dry with indentations, patient complains of burning	"tongue sticks to roof of mouth," dry	moist
c. mucous membrane of the palate, uvula, and tonsillar fossa	red with general inflammation, blisters, & pinpoint brown spots on palate subsequently, oral mucosa becomes pale, almost white	dry, pale palate	moist, pink
d. gingival tissue	red, shiny, bleeding, edematous	pink to red shiny, edematous	moist, resilient pink
e. teeth	dull, debris clinging to two-thirds of surface visible	dull, mucus and debris clinging to enamel in one-half area visible	glossy, no debris
f. saliva	ropy, viscid, or mucid	mouth dry or saliva scanty	thin watery entire oral cavity moist
g. taste	impaired	impaired	normal taste sense
h. voice	difficulty in articulating words	deep and raspy	normal tone and quality

APPENDIX D

Data Collection Sheet

DATA COLLECTION SHEET

Age (yrs.): _____

Sex (M or F): _____

Race: _____

Formal Education (yrs.): _____

Principal Occupation: _____

Residence prior to admission: _____

Number of natural teeth: _____

Presence of dentures: No_____ Full upper_____

                       Full lower_____ Partial dentures_____

Performance of oral care prior to hospitalization:

                       Self_____ Others_____

Frequency of dental care: Twice yearly_____ Once yearly_____

                       Every two years_____ Emergency only_____

Date of last dental care: 1980_____ 1979_____ 1978_____

    1977_____ 1976_____ 1975_____ before 1975_____

Agent used for oral care: Mouthwash only_____ Toothbrush and

    dentifrice_____ Dental floss _____ None_____

Frequency of personal oral care: Brush and floss at least

    once daily_____ Brush at least once daily _____ Brush

    and floss less than once daily_____ Brush less than

    once daily_____ None_____

Reason for hospitalization:_____

Current medical conditions which may affect oral status:

_____

Current medications which may affect oral status:

_____

To be Completed on Patients Receiving Second Assessment

    (Days noted according to day of study: Day 1 =

    day of initial assessment, etc., through Day 8,

    final assessment)

O_2_____ Days_____

Dietary changes_____ Days_____

Surgery or other procedures:_____

    Days_____

NPO_____ Days_____

Fluid restriction: Amt. _____ Days_____

Limitation in oral self care: _____

    Days_____

Medication changes:

    Additions:_____

    Deletions:_____

    Change in Dosage_____

Other:_____

APPENDIX E

Tables

Table A

Distribution of Sample Subjects

According to Demographic Characteristics

Demographic Characteristic		Total Sample (N=28)		Subsample (N=16)	
		Number	%	Number	%
Sex					
Male		28	100.0	16	100.0
Female		0	0.0	0	0.0
	Total	28	100.0	16	100.0
Age					
60-69		22	78.6	14	87.5
70-79		5	17.8	2	12.5
80-89		1	3.6	0	0.0
	Total	28	100.0	16	100.0
Race					
Caucasian		27	96.4	15	93.8
Black		1	3.6	1	6.2
	Total	28	100.0	16	100.0
Formal Education					
Eighth grade or less		9	32.1	5	31.2
Ninth through twelfth grade		14	50.0	8	50.0
Beyond twelfth grade		5	17.9	3	18.8
	Total	28	100.0	16	100.0
Primary Occupation					
Professional and technical		3	10.7	2	12.5
Managers and officials		2	7.1	2	12.5
Clerical and sales		1	3.6	1	6.3
Craftsmen and firemen		8	28.6	4	25.0
Operatives		7	25.0	5	31.2
Service workers		1	3.6	1	6.3
Laborers		4	14.3	0	0.0
Everything		2	7.1	1	6.3
	Total	28	100.0	16	100.0
Residence Prior to Admission					
Private residence		25	89.3	15	93.7
Domiciliary		1	3.6	1	6.3
Another hospital		2	7.1	0	0.0
	Total	28	100.0	16	100.0

Table B

Distribution of Sample Subjects According to

Dental and Oral Care Practices

Dental and Oral Care Practices		Total Sample (N=28)		Subsample (N=16)	
		Number	%	Number	%
Frequency of Visits to Dentist					
Twice yearly		3	10.7	2	12.5
Once yearly		4	14.3	3	18.8
Once every two years		1	3.6	0	0.0
Emergency only		20	71.4	11	68.7
	Total	28	100.0	16	100.0
Date of Last Dental Care					
1980		6	21.4	3	18.8
1976-1979		14	50.0	8	50.0
1975 or earlier		8	28.6	5	31.2
	Total	28	100.0	16	100.0
Agent Used For Personal Oral Care					
Toothbrush, dentifrice & floss		5	17.9	3	18.7
Toothbrush and dentifrice		19	67.9	11	68.7
Mouthwash only		2	7.1	1	6.3
None		2	7.1	1	6.3
	Total	28	100.0	16	100.0
Frequency of Personal Oral Care					
Brush & floss at least once daily		2	7.1	1	6.3
Brush at least once daily		18	64.3	13	81.2
Brush and/or floss less than once daily		4	14.3	0	0
None		4	14.3	2	12.5
	Total	28	100.0	16	100.0

Table C

Distribution of Sample Subjects According to

Reason for Hospitalization

Category by Disease	Total Sample (N=28)		Subsample (N=16)	
	Number	%	Number	%
Coronary artery disease	8	28.6	4	25.0
Chronic obstructive pulmonary disease	2	7.1	0	0.0
Lung cancer	2	7.1	2	12.5
Cataract surgery	2	7.1	1	6.3
Pneumonitis	1	3.6	0	0.0
Arteriosclerotic peripheral vascular disease	1	3.6	1	6.3
Renal-rejection of kidney transplant	1	3.6	1	6.3
Thrombophlebitis	1	3.6	1	6.3
Low back pain	1	3.6	1	6.3
Vertigo	1	3.6	1	6.3
Degenerative joint disease (hip replacement)	1	3.6	1	6.3
Diabetes	1	3.6	1	6.3
Skin cancer (surgical excision)	1	3.6	1	6.3
Prostatectomy	1	3.6	1	6.3
Alcoholic liver disease	1	3.6	1	6.3
Chronic lymphocytic leukemia	1	3.6	0	0.0
Congestive heart failure	1	3.6	1	6.3
Gastrointestinal evaluation	1	3.6	0	0.0
Total	28	100.0	16	100.0

Table D

Distribution of Sample Patients According to

Medical Conditions Which May Affect Oral Status

Condition	Total Sample (N=28)		Subsample (N=16)	
	Number	%	Number	%
Renal disease (transplant rejection)	1	3.6	1	6.3
Metastatic malignancy	2	7.1	2	12.5
Diabetes	3	10.7	2	12.5
Nutritional deficits	1	3.6	1	6.3
Anemia	2	7.1	1	6.3
Leukemia	1	3.6	0	0.0
Alcoholism	2	7.1	1	6.3
Oral lesion	2	7.1	1	6.3
Calculus*	9	32.1	5	31.3
Periodontal disease*	4	14.3	3	18.8
Total**	27		17	

*Periodontal disease was included if there was a dental diagnosis included in the chart. Since only 9 patients received a dental exam while hospitalized this figure is not absolute for those who did not have the exam. Calculus was included if noted on dental exam or if it was severe enough to be grossly observable to the investigator.

**Several patients had more than one condition so totals refer to number of times a particular condition occurred, not number of patients

Number of conditions per patient	Total Sample (N=28)		Subsample (N=16)	
	Number	%	Number	%
Number of patients with 3 conditions	4	14.3	2	12.5
Number of patients with 2 conditions	4	14.3	4	25.0
Number of patients with 1 condition	6	21.4	2	12.5
Number of patients with 0 conditions	14	50.0	8	50.0
Total	28	100.0	16	100.0

Table E

Distribution of Sample Subjects According to

Drug Therapy Which May Affect Oral Status

Classification of Medications	Total Sample (N=28)		Subsample (N=16)	
	Number	%	Number	%
1. Drug classes				
Diuretics	11	39.3	7	43.8
Tranquilizers	5	17.9	3	18.8
Steroids	3	10.7	1	6.3
Antineoplastics	2	7.1	1	6.3
Antibiotics	1	3.6	0	0.0
Anticoagulants	1	3.6	0	0.0
2. Specific Drugs				
Digoxin	8	28.6	4	25.0
Salicylates	5	17.9	5	31.3
Total*	36		20	

*Figures refer to number of patients taking each classification of drugs. Since many patients were taking more than one drug, totals are not reflective of number of patients, but number of times particular drug classes are seen in samples.

Of above List of Drugs, Number of Drugs per Patient	Total Sample (N=28)		Subsample (N=16)	
	Number	%	Number	%
Number of patients taking 4 drugs	1	3.6	1	6.3
Number of patients taking 3 drugs	3	10.7	1	6.3
Number of patients taking 2 drugs	8	28.6	5	31.3
Number of patients taking 1 drug	7	25.0	4	25.0
Number of patients taking 0 drug	9	32.1	5	31.3
Total	28		16	

Table F

Oral Status Scores for Each Subject

Included in the Sample

Subject by Number	Bruya-Madeira Assessment Guide			O'Leary Plaque Control Record		
	Initial Score	Final Score	Change	Initial Score	Final Score	Change
*1	17	18	+1	21	17	-4
*2	17	17	0	53	40	-13
*3	18	18	0	53	52	-1
*4	17	17	0	05	12	+7
*5	18	18	0	41	35	-6
*6	17	18	+1	29	39	+10
*7	19	20	+1	46	38	-8
8	17			44		
9	18			49		
10	18			48		
11	19			30		
12	20			22		
*13	17	17	0	38	25	-13
*14	18	18	0	37	41	+4
15	19			46		
16	18			72		
*17	20	20	0	46	57	+11
18	22			58		
19	22			50		
*20	19	24	+5	93	91	-2
*21	18	17	-1	81	75	-6
22	17			88		
*23	21	20	-1	80	63	-17
*24	17	18	+1	53	66	+13
25	20			78		
26	19			83		
*27	17	17	0	51	37	-14
*28	23	22	-1	65	51	-14

*Denotes subjects comprising the subsample.

Table G

Distribution of Sample Subjects According to Each

Category of the Bruya-Madeira Oral Assessment Guide

Categories of Bruya-Madeira Tool	Total Sample (N=28)			Subsample (N=16) Init.Scores			Subsample (N=16) Final Scores		
	3	2	1	3	2	1	3	2	1
1. Physical Status									
a. Level of consciousness	0	0	28	0	0	16	0	0	16
b. Breathing habits	0	1	27	0	1	15	0	0	16
c. Nutritional habits/ diet	0	3	25	0	1	15	0	0	16
d. Chewing ability	2	10	16	0	5	11	0	5	11
e. Self care ability	0	0	28	0	0	16	0	0	16
2. Oral Cavity									
a. Lips									
Texture	0	3	25	0	2	14	0	5	11
Color	0	0	28	0	0	16	0	1	15
Moisture	1	0	27	1	0	15	1	0	15
b. Tongue									
Texture	1	7	20	0	5	11	0	2	14
Color	0	0	28	0	0	16	1	0	15
Moisture	0	0	28	0	0	16	0	0	16
c. Mucous membrane of palate, uvula and tonsillar fossa	0	1	27	0	1	15	0	1	15
d. Gingival tissue	0	6	22	0	1	15	0	3	13
e. Teeth	0	6	22	0	0	16	0	0	16
f. Saliva	0	0	28	0	0	16	0	0	16
g. Taste	0	1	27	0	0	16	0	1	15
h. Voice	0	0	28	0	0	16	0	0	16

Table H

Presence of Oral Stressors in Subsample Subjects

During a One Week Period of Hospitalization

Patient by Number (Subsample, N = 16)

Oral Stressors	1	2	3	4	5	6	7	13	14	17	20	21	23	24	27	28
Oxygen																
Nondetergent diet																
Fluid restriction																
NPO greater than half day														X		
Target Drugs																
Increase in amount				X	X			X			X		X			
Decrease in amount											X	X		X		
One time dose						X								X		
Surgical Procedures													X	X		

Change in Oral Scores	1	2	3	4	5	6	7	13	14	17	20	21	23	24	27	28
Bruya-Madeira Tool	1	0	0	0	0	1	1	0	0	0	5	-1	-1	1	0	-1
O'Leary Plaque Tool	-4	-13	-1	7	-6	10	-8	-13	4	11	-2	-6	-17	13	-14	-14
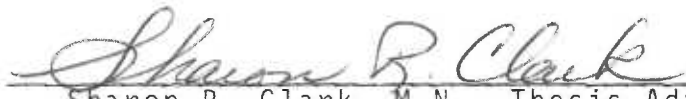
AN ABSTRACT OF THE THESIS OF

JESSIE F. ZAVIN

for the Master of Nursing

Date of Receiving this Degree: June 8, 1980

Title: A DESCRIPTION OF THE STATUS OF THE ORAL CAVITY OF
ELDERLY PATIENTS AT ADMISSION AND AFTER ONE WEEK OF
HOSPITALIZATION

Approved: _____
Sharon R. Clark, M.N., Thesis Advisor

The elderly have been identified as a high risk group
for disruptions in oral status. Oral health also may be fur-
ther compromised during hospitalization. Although nurses have
a responsibility to assess the health needs of their patients
and to implement appropriate interventions, no documentation
of nursing studies evaluating the oral status of elderly
patients upon admission to the hospital could be found. The
purpose of this study was to describe the status of the oral
cavity of aged patients upon admission and after one week of
hospitalization.

Twenty-eight patients, aged 60 and older, who were admit-
ted to general medical and surgical floors of a federally fun-
ded hospital were evaluated within 48 hours of admission.
Sixteen of the original 28 patients remained in the hospital
one week and received a second evaluation. Oral status was
measured by the Bruya-Madeira Oral Assessment Guide and the

O'Leary Plaque Control Record. Additional data was collected on demographic characteristics, dental and oral care practices, medical conditions and drug therapy known to influence oral status, and the presence of additional oral stressors during hospitalization.

Oral problems were detected in 67.9% of the sample by the Bruya-Madeira tool and 96.4% by the O'Leary instrument. These figures were consistent with those of a prior study which reported on the oral status of all patients admitted to a hospital during an eight month period. Oral status scores after one week of hospitalization were not significantly different from those seen on admission (p .05).

A large proportion of the elderly patients in this study had oral problems upon admission to the hospital. Although oral status did not significantly deteriorate during hospitalization, neither did it improve. Since nurses are responsible for oral hygiene care, these are important findings. The study identified a group of patients who may well need additional assessment and intervention to ensure that oral hygiene status improves during their hospital stay.