

The Importance of Oral Care in the Elder Population

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In today's society, measures are taken to keep a child healthy and to prevent disease. The child grows and goes through life getting preventive physical checkups, visiting the dentist regularly, learning about good eating habits, and being instructed to avoid smoking. When the child reaches adulthood, parents, teachers, and family members hope the child has been given all the tools needed to maintain a healthy lifestyle as he or she ages. This is the relationship between growth and health as people hope it transpires in the years to come.

For the last two generations, numerous organizations have focused on keeping the teeth of young children healthy and cavity-free. Children are taught the importance of oral care in school. This population is looked after because they are dependent on others to help them achieve a healthy oral environment as well as a healthy body. Hopefully children who are growing up now will be healthier than people who were born at an earlier time, specifically the early 1920s through the late 1950s. While organizations are focusing on children's oral health, another group of dependent people are failing in oral health—the adult population.

The current adult population was not raised during a time when prevention was of utmost importance. As a result, they suffer from many health issues that, with proper education, may have been preventable. The process of aging, in and of itself, presents many health challenges.

As humans age many changes take place both physically and cognitively. This is the point in life when people may become dependent on care provided by a healthcare professional. One area of major concern is that of oral care. It has been reported that oral care of the elderly population is substandard. Reasons for this substandard care are numerous.

As a result of the recent publication of research findings, oral health has become a topic of great importance. Oral health is linked to many overall health problems. These problems have been known to dentistry for many years. However, it has just been within the last several years that these links have begun to be recognized by the medical community. Some of the systemic

diseases to which oral infections are linked include cardiovascular disease, stroke, adult onset diabetes, chronic obstructive pulmonary disease, arthritis, and Alzheimer's disease.

Individuals with evidence of oral infections are 30% more likely to present with myocardial infarction than subjects without oral infections.¹ A cross-sectional analysis of 1,342 dental patients demonstrated that patients with diabetes are three times more likely to present with inflammatory periodontal disease.¹ On May 25, 2000, the US Surgeon General published a report titled, *Oral Health in America*. The Surgeon General confirmed that poor oral health has a direct correlation with chronic infections.¹ With this evidence in current research and these comments being made by the former Surgeon General, it is apparent that poor oral health can affect overall health. By providing adequate assistance in daily hygiene protocols, those we care for can experience better oral health, which may result in better general health. Improved health can greatly improve the quality of life.

Times Have Changed

There was a time when providing oral health care for our patients was relatively simple. Most patients had few of their own teeth and only wanted to see a dentist when they had a problem such as a toothache or a broken denture. A decade or so ago, maintaining good oral hygiene for those we care for was not a high priority and little was known about how important oral health was for overall health and quality of life.

Times have changed and today's patients have more natural teeth and higher expectations about their oral health care than ever before. They and their families now want to maintain a healthy mouth and teeth for a lifetime so they can look and feel their best. However, this can be a challenge since patients also have more health problems, disabilities, and greater care needs than ever before.

INTRODUCTION

While the number of Americans who are 65 years of age or older will increase dramatically in the coming years, it is predicted that another age group will more than double. The number of Americans older than 85 years of age is expected to more

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than double from 6.3 million in 2015 to 14.6 million by the year 2040.² Rapid growth of this population will dramatically impact oral health, since in this era, increased numbers of older adults retain their teeth.

The landmark 2000 report on oral health by the US Surgeon General documented profound disparities in the oral health status of older Americans.¹ Over 25% of people aged 65 to 74 have severe periodontal disease. In 2003, Oral Health America released its national grading report emphasizing that the oral health of older Americans is in a “state of decay.”³ Every state received failing or near failing grades in all categories of dental services for older adults, especially preventive and periodontal care.⁴ The current state of geriatric oral health expertise in the US is also thought to be woefully inadequate.

Caregivers competent in oral health are not being trained in numbers sufficient enough to meet projected workforce needs.⁵ Healthcare professionals must develop the skills to manage oral health needs of the elderly. Such skills will improve the overall oral health in those we care for. Research demonstrates that elderly individuals whose comprehensive management includes dental care develop fewer co-morbid conditions and require less expenditure of healthcare dollars.⁵

Healthcare professionals must be able to provide education and training regarding⁶:

- Relationship of oral health to general health
- Importance of daily oral care
- Means to provide basic oral care
- Referral to a dental professional when necessary

As patients become disabled or experience cognitive dysfunction, case managers will also need to address ethical issues relevant to dental diagnosis, treatment planning, and how care is provided.⁶ In treatment planning, the focus should be on identifying an optimal level of care for the patient (ranging from none to very extensive). In other words, optimal care should not by definition be highest level technically possible. Rather, it should be to establish a level of care appropriate to maintain oral and general health. Other issues that should be considered within this framework are alternative treatment procedures or techniques, expanding the oral care team to include other health professionals or paraprofessionals, and the potential interactions of oral disease with systemic conditions.

ORAL HEALTH CHALLENGES

Financial

Numerous socioeconomic issues can present obstacles for patients of any age who wish to obtain dental care. However, geriatric patients may experience additional barriers in their attempts to maintain dental health. Financing is the primary

obstacle. Most patients older than 65 years of age are retired and therefore no longer have dental insurance as an employee benefit. Without this option and with income limited to retirement savings, social security income, and any pension plan benefits, the costs associated with dental treatment may not be easily accommodated. Funding from federal, state, and county sources is often limited, both in available funds and treatment coverage. Available financial resources among the geriatric population vary considerably. Unfortunately, many older adults live near or even below the poverty level and have difficulty in affording basic preventive dental care.

Medical problems

Medical problems can also present as a major obstacle in the provision of dental care for geriatric patients. Many older adults are afflicted with at least one chronic disease and most have experienced medical problems. Even with Medicare insurance, the cumulative costs of medical treatment and medications can escalate and contribute to budgetary concerns, making it difficult to afford dental care. Coping with serious medical problems may leave older adults without the motivation and ability to seek dental care. Some medical problems may also lead to one spouse assuming the role of caretaker for the other. If this is the case, both can have difficulties in obtaining dental care.

Transportation/Access to Dental Care

Another problem is transportation. More than 30% of older adults, in particular, report transportation problems as the reason they have unmet dental care. These problems can include cost of transportation and driver/passenger status.⁷

THE DANGERS OF POOR ORAL HEALTH

The mouth is called the gateway to the body. Non-regular teeth cleanings causes bacteria to build up in the mouth making gums and teeth more susceptible to decay. These bacteria can also have more serious effects.

Dental Caries (cavity)

More than 90% of adults have had cavities before age 30.⁸ Cavities are transmissible localized infections caused by a multifactorial etiology linking complex risk factors and protective factors, which we will discuss further later on. In order for cavities to develop, four interrelated factors must occur:

- Patient’s diet must consist of repeated digestion of refined carbohydrates.
- Patient’s resistance to disease is decreased.
- Time factor.
- Specific bacteria (*Streptococci* or *S. mutans*) must be present in the dental plaque.

The bacteria *S. mutans* play an active role in the early stages of cavity development, whereas the bacteria lactobacilli contribute to the progression. Did you know that enamel is the most highly mineralized hard tissue in the body? Enamel is made up of a protein network consisting of microscopic mineralized hydroxyapatite crystals arranged in rods or prisms. This network facilitates the diffusion of fluids, such as calcium and phosphate ions distributing these ions throughout the enamel. As patients consume carbohydrates, the carbohydrates are broken down in the oral cavity by the protein enzyme amylase causing lactic acid to be produced. The lactic acid demineralizes the enamel matrix. If the demineralization of enamel is not reversed by the action of fluoride or calcium and phosphate ions, then the demineralization process continues further into the tooth structure, affecting the dentinoenamel junction and eventually the dentinal layer. The dentinoenamel junction is the boundary between the enamel and the underlying dentin that form the solid architecture of a tooth.⁹

A cavity develops in three stages of demineralization:

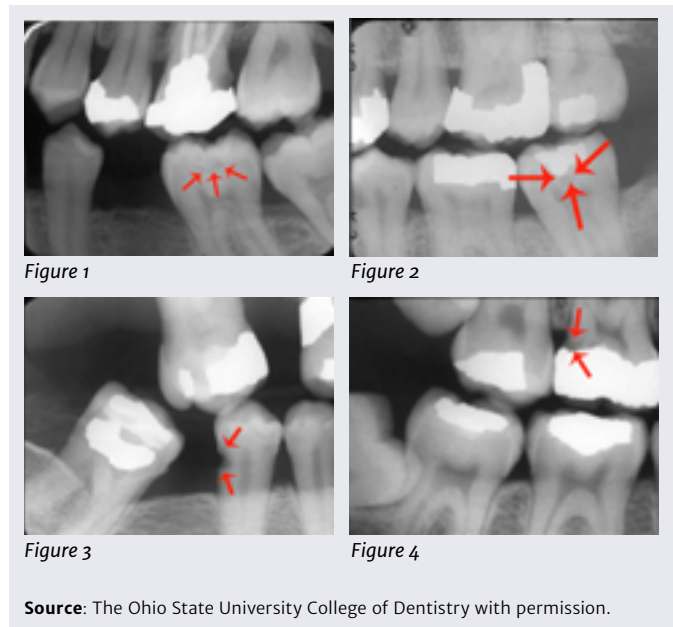
1. **1st stage – demineralization of enamel.** This can be reversed with the daily use of the fluoride, calcium, and phosphate ions, persistent oral hygiene care to reduce plaque that harbors cariogenic bacteria, and a reduction of refined carbohydrates.
2. **2nd stage –** progression of demineralization of hard tooth tissue leading to the dental-enamel junction and into the dentinal layer.
3. **3rd stage –** is the actual cavitation in the dentinal layer. Neither of the last two stages can be reversed and require mechanical removal of dental caries.

Cavities Occur in Four General Areas of the Tooth

1. **Pit and Fissure Cavities (Figure 1)** – includes Class I occlusal surfaces of posterior teeth, lingual pits of maxillary incisors, and buccal surfaces of mandibular molars.
2. **Smooth Surface and Interproximal Surface Cavities (Figure 2)** – includes Class V buccal, lingual surfaces of anterior and posterior teeth, and Class II interproximal surfaces of all teeth below the interproximal contact points.
3. **Root Surface Cavities (Figure 3)** – cementum is exposed due to teeth traumatized by conditions such as malocclusion, consistent bruxing or clenching. Due to cementum being only 50% mineralized, root surface caries can occur if the patient receives multiple lactic-acid exposures.
4. **Recurrent or Secondary Cavities (Figure 4)** – includes caries seen adjacent to or beneath an existing restoration.

Methods to Determine Risk of Cavity Development

Risk factors are the lifestyle and biochemical determinants that contribute to the development and progression of the disease. We know that patients who are at risk include those with cer-



Source: The Ohio State University College of Dentistry with permission.

tain socioeconomic factors (low education level, low income), patients with certain factors related to general health (diseases, physically or mentally compromised individuals), and those patients with epidemiologic factors (living in a high-caries family or having a past caries experience, especially new caries in the last 3 years). It is well known that multiple factors can contribute to the development of cavities. The key to prevention is to determine potential risk factors and establish an individual treatment plan for each patient (Table 1).

IMPORTANCE OF PERIODONTAL HEALTH IN THE ELDERLY

There is no doubt that poor oral health negatively impacts general health. Most chronic inflammatory diseases and conditions are cumulative and thus manifested later in life. Years, even decades, of oral neglect contribute to additional health problems in the elderly population, which already consumes the majority of healthcare dollars nationwide, placing a significant burden on the healthcare system. Maintaining optimal periodontal health in midlife may do more to reduce healthcare expenditures in one’s remaining lifespan than any other public health measure. Thus, optimal oral health cannot be reserved only for those who can afford basic care, but it must be a national priority to improve the overall health of everyone.

Physiological/Biochemical Link

Many chronic inflammatory conditions share some common physiological and biochemical elements with periodontal disease.¹⁰ Periodontitis is more than a localized oral infection.

TABLE 1 Risk Factors for Cavity Development

Oral Risk Factors	<ul style="list-style-type: none"> • New cavities? • Previous cavities in the last three years? • Recurrent cavities around restorations? • Deep pits and fissures? • Orthodontic treatment?
Home Care: Oral Hygiene and Fluoride Exposure	<ul style="list-style-type: none"> • Plaque present? • Current understanding of plaque control and the patient's motivation? • Brushes with fluoridated toothpaste daily? • Drinks city-added or naturally occurring fluoridated water?
Dietary Analysis	<ul style="list-style-type: none"> • Carbohydrate intake, including frequency (sugary drinks such as soda, fruit juice, energy, and sports drink consumption)?
Microbial and Salivary Factors	<ul style="list-style-type: none"> • Bacterial count? • Xerostomia? • Physiological conditions? • Prescription drugs affecting saliva rate? • Salivary stones?
Family or Social Risk Factors	<ul style="list-style-type: none"> • Multiple in-between carbohydrates/day ingested? • Dental fear? • Family caries history?
Immunity/Medical Risk Factors	<ul style="list-style-type: none"> • Chronic diseases? • Medically or physically challenged?

Recent data indicate that periodontitis may initiate changes in systemic physiology and biochemistry that alter immune function, serum cytokine/lipid levels, and tissue homeostasis.¹⁰

Diabetes and Insulin Resistance

Severe gum disease (periodontitis) hinders the body's ability to use insulin. And high blood sugar can worsen gum infection. The American Diabetes Association recommends:

- Controlling blood glucose level
- Keeping caregivers/dentists informed of any changes in condition
- Not smoking
- Getting dental checkups/cleanings every 6 months

Periodontitis and diabetes is the most obvious example of a systemic disease predisposing one to oral infection, and once that infection is established, it may in turn exacerbate the disease.¹¹ However, an oral infection might also predispose otherwise healthy patients to systemic disease.¹⁰ Diabetic patients are prone to elevated serum low-density lipoprotein/triglycerides, even when blood glucose levels are controlled.¹² Elevated lipid levels alter immune cell function, producing an inflammatory immune cell phenotype. This predisposes an individual to chronic inflammation and progressive tissue breakdown and diminishes the capacity to repair tissue.

Periodontitis-induced bacteremia may also elevate levels of serum pro-inflammatory cytokines. The activities of the cytokines alters lipid metabolism and leads to hyperlipidemia, observed in diabetes. Additionally, these factors can produce an insulin resistance syndrome that leads to diabetes.

Atherosclerosis-Induced Diseases

It has been hypothesized that periodontitis triggers the development of other systemic conditions that disproportionately affect the elderly, particularly cerebrovascular disease, cardiovascular disease (CVD), rheumatoid arthritis (RA), and dementia.¹⁰

Neurodegenerative Diseases

Neurodegenerative diseases such as Alzheimer's and Parkinson's have moved from medical speculation to mainstream thinking. Brain mononuclear phagocytes, particularly microglia, protect the nervous system. Microglia are activated by environmental stimuli including pro-inflammatory cytokines and bacterial lipopolysaccharides, initiating a cascade of neuroinflammatory events. Systemic inflammation is associated with signals transferred from blood to brain via perivascular macrophages and microglia. Resultant neuroinflammatory responses include secretion of neurotoxic factors mediating neuronal cell injury and death. Over time a slow, smoldering inflammation in the brain may destroy sufficient neurons to cause clinical manifestations of Alzheimer's or Parkinson's dementia.

Memory can be impacted by insulin activity. Insulin resistance is associated with age-related memory impairment and Alzheimer's disease. Thus, the previously described periodontitis-induced insulin resistance may contribute to pathologic mechanisms underlying neurodegeneration, as might the described links between periodontitis and vascular disease. Increasing evidence indicates that several pathogenic mechanisms promoting atherosclerosis also function in neurodegenerative diseases. Alzheimer's disease and vascular disease share some biological mechanisms and risk factors, such as lipid metabolism dysregulation and systemic inflammation.

Respiratory Diseases

Bacterial components of dental plaque are a major cause of respiratory infections in older adults, especially those institutionalized. Up to 48% of infections result from aspiration pneumonia, and the cost to treat patients developing pneumonia has increased dramatically. Aspiration pneumonia is a significant cause of morbidity, hospitalization, and mortality, especially in the nursing home population.¹³

When host defense mechanisms are compromised because of disease, aging, poor nutrition, or other conditions, the aspiration of a large pathogenic inoculum from periodontally involved teeth overwhelms normal flora and significantly increases the risk of respiratory infection. Bacteria constitute approximately 70% to 80% of solid plaque material and 1 mm³ of plaque contains more than 106 bacteria of 300 different aerobic and anaerobic species. Aspiration of plaque bacteria by older patients often leads to lower respiratory tract infections, such as aspiration pneumonia or pneumonitis, and recent evidence links anaerobic bacteria from periodontopathic biofilms with aspiration pneumonia in elderly persons. Thus, poor periodontal health and accumulation of dental plaque is a major contributory factor in respiratory infections.

EFFECT OF AGING ON THE PERIODONTAL-SYSTEMIC CONNECTION

Age may also predispose individuals to the periodontal-systemic connection. It is well known that the incidence of periodontitis and the severity of untreated periodontal disease increase with age.

Aging is associated with increased insulin resistance. Likewise, the incidence and severity of diabetes also increases with age.¹⁴ These conditions may result from loss of an individual's capacity to respond to environmental challenges. Some investigators attribute this association to an imbalance of important intracellular divalent cations such as calcium and magnesium that make cells vulnerable to ionic disturbances.¹⁴ Many other systemic diseases/conditions associated with chronic inflammation also demonstrate increased incidence and severity with advancing age.

Masticatory Function and Nutrition in Older Adults

There is significant evidence associating dietary imbalance with systemic illnesses. Oral health significantly influences dietary intake, particularly aspects of oral health related to masticatory function and edentulism (toothlessness/loss of some teeth).

Mastication (chewing) is the first step in digestion and is essential in optimizing dietary intake. An older individual's ability to chew is influenced by three variables: the number of natural teeth, overall health of those teeth and the functional status of

dental prostheses. Many older people rely on dentures for oral function, and even those who are dentate may require either partial dentures or a full denture in one jaw opposed by some natural teeth. Additionally, over 25% of those aged 65 to 74 have severe periodontal disease likely accompanied by varying levels of pain or dysfunction.¹

Compromised masticatory function causes variation in food choice to foods that an individual with impaired chewing can tolerate. Thus, poor oral health, especially poor periodontal health and tooth loss, may negatively impact systemic health by disturbing nutritional intake.

Tooth loss is correlated with changes in diet that may contribute to increased risk of developing chronic diseases.¹⁵ Losing natural teeth and/or pain associated with oral infection may impair one's ability to chew. This outcome is particularly relevant to people residing in institutional settings where chewing may not be monitored. Dental prostheses may not always restore full masticatory function, resulting in significant dietary changes through altered food choices or food preparation methods. As masticatory efficiency declines, people report increasing difficulty chewing foods and may choose not to eat foods difficult to chew, such as steak or raw fruits and vegetables. People handicapped by their dentition consequently suffer impaired intake of fruits, vegetables, and some key nutrients. Decreased intake of total calories, proteins, non-starch polysaccharides and vitamins is often accompanied by increased consumption of sugars and fats.

Reduction in dietary fiber and in fruit and vegetable consumption is associated with increased risk of CVD and certain cancers (breast, cervical, prostate, pancreatic, gastric and colorectal), most likely because of the lipid-lowering capabilities of soluble fiber and the beneficial effects of anti-oxidants in fruits and vegetables. Links have been demonstrated between deficiencies of these micronutrients, tissue breakdown, and cardiovascular disease and stroke in the elderly.

Restoration of masticatory function by dental intervention alone will not necessarily lead to improved nutritional intake.¹⁶ Individualized dietary advice should be provided at the time of denture insertion.¹⁶ It is important to note that an individual's ability to respond to nutritional advice will be moderated by their oral health status. All care providers, including the patient's dentist will have to work closely with the comprehensive care team to encourage a diverse and healthy dietary pattern. This could be accomplished in part while the patient receives instructions for use of complete dentures by challenging the patient to explore new foods and chewing methods. Dietary support and advice should always be given to patients being converted to edentulism for the first time, since using complete dentures as a masticatory tool is a challenge that will often be met by the blender unless

positive support and advice is forthcoming from all caregivers. It is widely recognized that a significant proportion of elderly people admitted to hospitals suffer from nutritional deficiencies and that adequate nutrient intake is an important determinant of recovery from illness. Plans for nutritional support may be required for edentulous subjects during such recovery, and professional dental help may be required to help such patients cope with poorly fitting dentures.

Physical and Cognitive Deficits

Effective brushing and flossing are essential in maintaining periodontal health and minimizing the development of cavities, but these home-care procedures require persistence and an average degree of dexterity.

Caregivers should continue to evaluate the patient's ability to brush and floss properly and make appropriate recommendations if these skills are lacking. The use of a toothbrush with a custom grip and flossing aids can be excellent adjuncts for the daily oral hygiene of patients with physical impairments. For some patients, supplemental items, such as antibacterial mouth rinses, including 0.12% chlorhexidine, prescription-strength fluoride gels, and custom fluoride trays, may be required to meet their oral hygiene requirements. Caretakers may need to take an active role in assisting patients with oral hygiene regimens. These physical impairments can occur as a result of many conditions, including stroke, connective tissue disease, and joint conditions. It may be an issue for stroke victims when the dominant side is involved. Connective tissue diseases, such as scleroderma and fibromyalgia, may affect the dexterity of geriatric patients and make attempts to maintain an appropriate level of oral hygiene difficult.

Cognitive Impairment

Approximately 5% to 8% of individuals 65 years of age and older and 50% of patients 85 years of age and older have dementia. Alzheimer's disease is the origin of 50% to 70% of all dementia cases.¹⁷ Dementia is the general term for a condition of progressive deterioration of brain function and eventual decline in intellectual capacity. In patients with dementia, abilities related to memory, thinking, and speaking all worsen over time. Individuals afflicted with Alzheimer's disease often live for many years after the diagnosis. The initial stages of Alzheimer's disease are characterized by subtle mild cognitive impairment that may not be readily apparent, even to family members. The disease progresses at variable rates but ultimately leads to the inability to speak coherently or respond appropriately to stimuli within the local environment. Eventually, ambulation, mastication, and swallowing will become extremely difficult if not impossible.

Progression of Alzheimer's disease usually leads to deterioration in oral health as the cognitive and neuromuscular elements

essential for the basic skills for brushing and flossing continually diminish. Caregivers of Alzheimer's disease patients may have difficulty in performing these tasks. Further, with the advancement of the disease, patients may become less tolerant of and less cooperative with dental treatment. There will come a time when only emergency dental treatment performed under sedation is possible. Clinicians involved in the care of Alzheimer's disease patients may need to establish a protocol of more frequent periodic visits to monitor oral health. If clinical presentation indicates poor oral hygiene and the rapid development of periodontal problems and dental caries between appointments, your patient may require several teeth to be extracted. Remember, loss of teeth may have an impact on your patient's diet. If a patient is fitted for new dentures, the prosthesis should have the name of the patient placed in the acrylic. This is particularly important for patients living with other denture wearers.

Oncology Patients

Patients who have been diagnosed with any type of cancer should have had a comprehensive clinical and radiographic dental examination completed as far in advance as possible of any surgical or chemotherapeutic treatments. Oncologists and physicians who treat cancer patients understand that optimal oral health will minimize the potentially serious oral complications that may develop after surgery, radiotherapy, and chemotherapy. As a case manager you will find that many of your patients under this care will have to have the teeth that cannot be restored extracted. Teeth in these categories may cause minor problems for healthy patients, but they can cause life-threatening infections for patients being treated for any form of cancer. Custom trays for fluoride gels should be provided for patients who receive radiotherapy for oral cancer or head and neck malignancies in order to minimize radiation caries. Patients who develop xerostomia secondary to radiation require more frequent dental appointments to optimize oral hygiene and evaluate the patient for the onset of radiation caries. If you hear of any oral health issues in this patient population, it is crucial to discuss their diet and ask questions about how they are taking care of their teeth/dentures.

Arthritis

Arthritis affects approximately 50% of individuals 65 years of age and older.¹⁸ Osteoarthritis is the most common form of the disease, affecting more than 30 million people in the United States alone.¹⁹ In the U.S. rheumatoid arthritis affects about 1.5 million people, 70% of who are women.¹⁸ The etiology of each form of arthritis is unknown and each form manifests in different ways. Osteoarthritis usually occurs in weight-bearing joints such as the hips, spine, and knees. Cartilage in the arthritic

joint degenerates over time, allowing two adjacent bones previously separated by cartilage to have direct bone-to-bone contact. Pain, joint stiffness, and restricted mobility are often a result. Rheumatoid arthritis occurs when the synovial lining of a joint becomes thickened and swollen. Inflamed cells within the area can release enzymes that cause degeneration of the bone and cartilage. The shape of the involved joint can change with accompanying loss of function and pain. This disease often has periods of remissions and painful exacerbations, with the majority of the destruction occurring in the beginning years. Most patients require long-term pharmacological treatment to provide pain relief and allow for some function of the involved joints. The joints of the hands and wrists are most commonly affected. Unlike osteoarthritis, rheumatoid arthritis is a systemic disease and can result in generalized manifestations such as lethargy, malaise, and weakness.

Hands and wrists that have been damaged by rheumatoid arthritis may have impaired dexterity, which can affect proper oral hygiene. Custom-modified toothbrushes and flossing aids can assist patients in maintaining oral health. If plaque accumulation is excessive, oral hygiene frequency will increase as this will be necessary to minimize periodontal involvement and decrease the development of caries. If partial dentures are made for arthritic patients, the design and placement of the clasps should be such that the placement and removal of these prostheses is facilitated. The preventive approach to dental problems will assist in the maintenance of oral health, which will positively impact quality of life.

Osteoporosis

Osteoporosis is a disease characterized by low bone mass and structural deterioration of bone tissue, leading to bone fragility and an increased risk of fractures. The hip, spine, and wrist are the most common sites of osteoporotic fracture. There is a significant gender differential in the occurrence of osteoporosis, as women are four times more likely to develop osteoporosis than men, with women losing bone mass at a faster rate than men.²⁰ More than 10 million Americans 50 years of age and older have osteoporosis, a number that is certain to grow as the geriatric population increases.²¹

In terms of oral health, the bone density of the mandible may be significantly decreased and at an increased risk for fracture in osteoporotic patients. However, this is not the most significant osteoporosis-related concern for the oral and maxillofacial complex. The primary concern is with the adverse effects of osteoporosis medications upon the bone of the maxillary or mandibular arch. Healthy bone metabolism is characterized by a delicate balance between bone formation and bone resorption. Osteoblasts are responsible for the formation of new bone during

growth and repair; osteoclasts are the large multi-nucleated cells responsible for the resorption of bone. During the aging process, osteoblastic activity decreases, with an associated decrease in bone mass and an increased susceptibility to fracture. Thus, bone metabolism will have a tendency toward bone resorption and bone weakening via osteoclastic activity.

LACK OF CAREGIVER EDUCATION

Caregivers are responsible for providing services to people in their care. Impaired manual dexterity combined with cognitive deterioration makes it difficult for some of our patients to perform oral self-care. Given the systemic complications that can be acquired due to poor oral care, it is important that caregivers are thoroughly educated in all aspects of oral health. Once all of the implications of oral care are understood, the likelihood of caregivers being diligent in providing oral care or providing guidance to improve oral health will increase.

In most curriculums there is little time devoted to the instruction of oral care, followed by very limited time spent practicing the clinical aspects of this task. Hands-on experience caregivers receive is done on classmates, on web-based virtual reality courses or mannequins, which is not realistic. Oral care is included in most personal hygiene text along with hair care and perineal care. Oral hygiene needs to be given a higher priority, equivalent to such disease prevention activities as turning a bedbound patient and ensuring adequate hydration. This is an unfortunate consequence given the fact that not enough information is given to caregivers during their education to successfully complete this task.

Brushing alone is not enough to remove food that lodges between the teeth, so flossing once a day is recommended as a part of good oral hygiene. In older patients, gingival recession (receding gums) is a common experience. Often the recession is so pronounced that the use of regular dental floss is not effective in cleaning the long expanse of exposed root structure. In addition to not being an effective way of cleaning root structures, flossing is a difficult task for caregivers. Many patients do not even cooperate with daily tooth brushing procedures, so how can the caregiver be expected to perform flossing? As case managers it is imperative that we arm our caregivers with up-to-date information and education in the area of oral care and provide on-going, mandatory oral care in-services and have on-going conversations with our patients and their loved ones to address any questions, comments or concerns regarding oral health.

COMFORT AND DIGNITY

In general, helping those we care for with oral hygiene is extremely important. Removing food and plaque from the

mouth prevents tooth decay, gum disease, and tooth loss. A clean mouth also increases comfort, enhances the taste of food, improves appearance, and prevents odors. Prevention of dental problems or minimizing problems will allow the caregiver assigned to that patient to focus their attention on other concerns. All oral care, like other personal care, should only be provided in privacy. This is usually easiest with the patient seated in the bathroom, but can also be done elsewhere in the room or in bed if necessary. Patients should be asked about their preferences concerning their oral hygiene and whether they would like to do this themselves or have some help. We can even teach family members how to help their loved one with oral health tasks.

We took a pretty deep dive into some of the challenges. Now let's take a closer look at what our patients should be doing to ensure good oral health.

NORMAL AGING CHANGES OF THE ORAL CAVITY

The outer surfaces of the teeth begin to wear, and teeth darken with age. The nerve inside of each tooth begins to shrink with calcification of the pulp space. This can reduce an older person's awareness of possible dental problems, such as cavities.

There is also some gum recession causing root exposure, which places teeth at greater risk for developing tooth decay.

The most common cause of oral health problems in people of all ages is plaque. Plaque is a soft layer of material that accumulates on the surface of the tooth and is composed mainly of bacteria. This is the fuzzy film that people feel on their teeth when they wake up in the morning. It is this accumulation of bacterial plaque that causes both periodontal disease and tooth decay, since the bacteria in plaque can use the sugar from food as fuel to make acid and toxins that irritate the gums and decay the teeth. For these reasons, it is important that the caregiver performs daily oral hygiene care as part of the normal care routine.

This includes:

- Regular use of a fluoridated toothpaste which can prevent tooth decay
- Brushing twice a day to remove food and plaque from the teeth, and also trying to floss if possible, to remove plaque from in between the teeth
- Denture and soft-tissue care, which can prevent the onset of oral ulcers, yeast infections, and other abnormal changes in the soft tissues of the mouth
- Helping patients get to a dental office visit by first reminding them of their appointment, and then completing oral care and toileting at the right time so that dental treatment goes smoothly

When we are working with our patients we should be asking about their preferences concerning their oral hygiene and whether they would like to do this themselves or have some help

from a caregiver or a family member.

Oral hygiene can be provided before breakfast, after meals, at bedtime, or other times as requested or necessary. Twice a day is best to maintain good oral health, and the single most important time is after the last meal of the day or just before bed, so that food and plaque will not sit in the mouth overnight, which can quickly cause oral disease.

Once teeth have been cleaned at the end of the day, it is best for the patient to avoid eating again until morning. This includes use of cough drops or candies, which are full of sugar and can quickly cause cavities.

Following brushing and flossing, some patients may like to use mouthwash to help remove debris and freshen the mouth. Remember that some mouthwashes may contain strong flavors and alcohol that can also irritate the mouth of some patients. If you patient mentions this then you can recommend that they rinse with water. Please note: Mouthwashes are never a substitute for tooth brushing, since they do not remove plaque well.

It is important to note that sponge applicators also cannot remove plaque from the teeth so they should never be used for tooth brushing unless it is absolutely medically necessary. They are only useful to remove food and debris from the mouth.

Because some patients are not always as aware or able to communicate about pain, eating problems, or other difficulties, dental problems often go unnoticed in their early stages. Therefore, when oral hygiene is provided, it is a good opportunity for the caregiver to carefully look at the patient's mouth and dentures for possible signs of oral health problems.

- Ask the patient if they are having any discomfort in the mouth, difficulty in eating, soreness from dentures, or other mouth problems.
- Any dentures should be removed and checked for signs of broken denture teeth, cracks, sharp edges, or other problems. If multiple denture wearers are in the home, make sure that the patients' name is on their denture cup.
- Caregivers and family members can ask the patient/loved one to open their mouth to check for broken or loose teeth, as well as lumps, bumps, or sores on the gums or other soft tissues in the mouth. Red or bleeding gums or foul odors are an important warning sign of problems and should be noted and brought to the attention of a supervisor/dentist/physician as soon as possible.

The single most important oral hygiene procedure for patients with natural teeth is tooth brushing. The things your patient will need to brush their teeth include:

- Cup for rinsing
- Toothpaste, preferably containing fluoride
- Soft-bristled regular toothbrush or a mechanical toothbrush

If a caregiver or family member is providing oral care, they may want a towel to place under the chin.

If a family member asks you how to brush their loved ones teeth:

- Begin by washing your hands.
- Wet the toothbrush and then apply a small amount of toothpaste to the toothbrush, about the size of a large pea.
- Remove any dentures in the mouth.
- If your loved one has dementia, be sure to approach slowly and explain what you are planning to do and always approach from the front; then move to the side as necessary to support their head and improve your access to the mouth.
- Start with the upper teeth and make sure to brush all sides of the teeth, including the sides towards the cheeks, tongue and the chewing surfaces.
- Gently brush the teeth on all sides using small, round motions and short back-and-forth strokes. Tell them to pay special attention to brushing at the gum line by holding the toothbrush at a slight angle toward the gums while you brush, about 45 degrees.
- After they have brushed the teeth for at least two minutes, with short breaks as needed, have your loved one spit out excess water and toothpaste, offer a cup of water to rinse and spit out excess toothpaste from the mouth.
- Use the cloth to dry the face after rinsing.

Flossing is the best way to remove plaque and food from in between teeth, but flossing someone else's teeth can sometimes be tricky.

The patient must be able to open their mouth and keep it open while the teeth are being flossed. If the patient is not cooperative or there is a risk that they may bite, then a different approach will be needed or flossing may not be possible. There are flossing tools that can be used to make the job easier.

When flossing is possible, it is best done once a day at bedtime, usually after tooth brushing.

If a family member asks you how to floss for their loved one you can provide them with these simple instructions:

- Using clean hands, tear off a piece of dental floss from the container that is long enough to reach from your hand to your elbow.
- Take one end of the floss and lightly wrap it around the middle finger of one hand, leaving about 8" of excess floss.
- Wrap the rest of the loose floss lightly around the middle finger of the opposite hand; you want to have about 6" of floss to work with, between the two middle fingers, and you want to save your index fingers and thumbs to do the flossing.
- Start by holding the floss on both sides with your index fingers, leaving about 1-2 inches in the middle as the "working" part of the floss.

- Beginning with the lower teeth, stretch your fingers out to reach to the last two teeth in the back, with one finger on the cheek-side and one finger on the tongue-side.
- Using a back and forth movement slide the floss down through the contact point of the two teeth, being careful not to cut the gum with the downward pressure.
- Use a gentle up and down motion while lightly pushing the floss toward the back tooth and then lightly pulling the floss toward the front tooth.
- Pull up to remove the floss from this area and move forward to the next two teeth that are touching, following around the lower teeth until all the teeth have been flossed.
- Repeat this technique on the upper teeth as well; you may need to move around to the patient's side to gain access to the upper teeth
- As plaque gets picked up by the floss, roll the soiled piece up onto the middle finger with less floss on it, and unwrap some more clean floss from the opposite middle finger. Continue in this way until all the teeth have been flossed.
- Offer a cup of water to rinse and spit out any food particles from the mouth. A mild mouthwash can be offered to freshen the mouth.
- Use the cloth to dry the face after rinsing.

Just like natural teeth, full or partial dentures build up plaque, calculus or tartar, and stains, so they also have to be cleaned thoroughly as often as natural teeth to keep the mouth healthy. When dentures are not kept clean, yeast infections, gum irritation, and bad breath can occur, and the dentures can become stained. Dentures can be cleaned by the patient themselves if they are able, but if not, a caregiver or family member should assist the patient/family member as indicated on the care plan. Dentures should be handled carefully, and protected from loss or breakage since they are expensive to repair or replace.

To clean dentures, the patient will need a denture brush or a regular soft toothbrush and some denture cleaner or toothpaste. A regular toothbrush can be used if preferred, but denture brushes are designed for this purpose and usually work better. Never use denture brushes on natural teeth.

If family members ask for instructions on how to care for their loved one's dentures, you may provide the following information and instructions:

Removal—Full Denture

Dentures should be removed. Full upper dentures are best removed by grasping the front denture teeth with the fingertips and then tipping the back of the denture downward. Full lower dentures are best removed by grasping the front denture teeth and gently pulling upward.

Removal—Partial Denture

Upper or lower partial dentures with metal clasps are best removed by pushing upward on the clasps with the tips of your fingers. When dentures have been removed, it is a good time to check the dentures for signs of broken teeth, cracks, sharp edges, or other problems, and report such concerns to your loved one's dentist. With the dentures removed, inspect the mouth for possible problems and be sure to clean the mouth and remaining teeth with a soft toothbrush and toothpaste as previously recommended. If there are no natural teeth, a sponge swab can also be used to clean the gums, but be sure not to use these for tooth brushing since they do not remove plaque very well. A mild mouthwash can also be offered at this time to help remove debris and freshen the mouth as shown before.

Dentures are best cleaned over a sink half filled with water and with a towel or wash cloth lining the sink to act as a cushion in case the denture should drop. Gently scrub the dentures with the denture brush and paste under running water, being careful to brush BOTH the inside and outside of the dentures to remove food, plaque, and denture adhesives. Rinse them under cool water. Do NOT soak or rinse dentures under hot water since this may affect their shape and fit.

For partial dentures with metal clasps, also be sure to carefully brush around the clasps to remove food and plaque. Bedtime is usually a good time to clean dentures, since it is best if they are left out for 6 to 8 hours each day to allow the gums some time to rest to help avoid irritation or infections of the soft tissues. Dentures can also be soaked in water with a denture cleaning tablet if desired, but soaking alone will not remove plaque, so this should only be done after brushing.

When dentures are not in the mouth, they should be kept in clean water with or without denture cleaner in a plastic denture cup, since drying them out may change the fit. Denture cleaners must also be completely rinsed off before the dentures are placed back in the mouth.

When dentures do not seem to stay in well by themselves, the careful use of denture adhesives can sometimes be helpful. However, it is important to remember that using too much adhesive or not cleaning out adhesives each day can lead to gum irritation and infections, and also feel unpleasant or affect the taste of food. Too much adhesive can even make dentures fit worse and change the bite. If lots of adhesive is needed, report this to the dentist so that the dentures can be checked to make sure they are not damaged and fit properly.

To use denture adhesive correctly:

- Make sure the dentures are clean and moisten them with a little water.
- Apply three or four small ribbons of adhesive paste evenly

towards both the front and back.

- Have the wearer place the dentures in the mouth and bite their teeth together to seat the dentures correctly.

Denture adhesives can be reapplied as needed during the day, but again, it is absolutely essential that adhesives be cleaned out at least once every day so that they do not build up in the denture and cause problems.

It is not uncommon to run into difficulties while trying to provide oral care. Patients with dementia may not understand what's happening to them or may not recognize the caregiver or family member. Oral discomfort can also cause a patient to try to avoid care.

The most frequent difficult behaviors are turning or pushing away, clenching the teeth, and biting or attempting to bite the caregiver/family member or the toothbrush. These behaviors are not uncommon and can be related to how care is provided. Generally, the best way to approach this situation is to make sure the patient is comfortable and that the surroundings are as familiar and pleasant as possible. The goal is to create a routine that is easy to do and consistent each day.

The person performing oral care should use a quiet and soothing voice, slow movements, and a gentle approach. The use of mouth props in consultation with the dentist may be necessary. Mouth props can usually be inserted into the mouth when the mouth opens slightly and then turned to help open the mouth wider for brushing. Mouth props must be used with caution to avoid injury to the lips or soft tissue.

Helpful hints and tips for caregivers and family members:

- Don't rush the person or the procedure; stress can increase a patient's agitation.
- Try providing the patient with some distraction, such as turning on the TV, some favorite music, or letting the person hold something of comfort to them.
- If possible, let the person help by holding and guiding the hand holding the toothbrush.
- If there is a language barrier, find someone that can help interpret for the patient.
- If all else fails, try re-approaching the patient at another time when they seem to be in a better mood, since difficult behaviors can come and go.

Patients who are unconscious, confined to bed, or have swallowing problems also need oral hygiene care for their comfort and dignity, but will need some special precautions to avoid gagging or choking.

For caregivers or family members:

- Remove dentures or partial plates before providing oral care. If possible, lower the head of the bed slightly, but not less than 45 degrees.

- Move the patient to the side of the bed nearest you.
- Position the patient on their side, or turn their head to the side.
- Place a towel under the chin along with an emesis basin to catch fluids from the mouth.
- A mouth prop can be used to keep the mouth open.
- If the patient has no teeth, a moist sponge applicator can be used to gently sweep the soft tissues of the mouth.
- Brush the teeth as previously described using a small amount of toothpaste on a moist soft toothbrush.
- After brushing, rinse the patient's mouth with about 10 ml of clean water using either a syringe or the sponge applicator.
- Allow the fluid to drain out of the mouth into the basin, or suction as needed.
- After oral care, dry the patient's face and also remove and empty the basin.
- A water-soluble lip moisturizer can also be applied.
- Dentures should also be cleaned as previously described and replaced in the mouth if early in the day, or stored overnight.

HOW CAN CASE MANAGERS IMPROVE ORAL HEALTH?

Become an Oral Health Champion

Establishing oral health champions is critical to successfully integrating oral health into your organization's programs and services.

For older adults, especially those with chronic illness, oral health can have a great impact. Poor oral health can exacerbate a health condition while positive oral health can improve a condition. Historically, there's been limited funding for oral health programs and services for the older adult population. By integrating oral health into the existing prevention programs and services of your organization, you can make a significant difference in the health and well-being of the patients you serve.

To successfully implement an oral health activity, you need to sell your message. A champion can make this happen by influencing the prioritization of oral health throughout your organization.

- Provide a strong voice and powerful visibility for oral health in your community.
- Promote partnerships and alliances to promote oral health.
- Increase awareness and knowledge of resources in your community.
- Present oral health messages to policy makers and other community leaders.

The results of program activities may be immediate; or, the results of advocacy may take time. Keep planting seeds wherever you go. You may be amazed at the future impact of your efforts!

Who Are the Oral Health Champions?

An oral health champion is someone within your organization who wants to help lead the charge of promoting good oral health.

An oral health champion:

- Understands the importance of oral health for those we care for.
- Is knowledgeable about the connection between oral health and overall health.
- Is eager to engage in continuous learning about oral health.
- Is motivated to share the message about the importance of oral health for older adults.
- Keeps oral health-related issues in the forefront of organization programs and services.
- Helps problem solve when challenges get in the way.

Internal champions are the leading force for identifying ways that oral health can be integrated into the programs and services your organization provides, and for implementing and supporting these activities. Internal champions can be from all levels within your organization, including:

- Program managers and program coordinators
- Information and assistance specialists
- Receptionists
- Finance specialists
- Direct service providers—nurses, caregivers, case managers, and social workers

Tips for Champion Building

- Engage the support of management from the start.
- Be on the lookout for champion prospects.
- Look for opportunities to spread key messages.
- Build alliances with recognized oral health organizations to provide credibility.
- Provide opportunities for numerous staff to become involved.

Achieving Success

There will be challenges to developing and sustaining champions, as advocates for services and programs. You may hear “no” many times before you get a “yes.” Champions will need to be creative and flexible. It may also be challenging to continuously keep the need to integrate oral health at the forefront, and not let it be pushed aside by other priorities. You may find it helpful to create a written plan, detailing the specific activities you want to implement as a way to maintain your focus. Your champions will be primed for success with a written plan that includes key milestones and timelines, demonstrating your organization's commitment.

As an oral health champion and a motivator of new champions, you play a significant role in increasing awareness about the importance of oral health. Your knowledge and energy will

inspire additional champions to join the cause. Always welcome opportunities to learn! The more you understand about oral health, the more you can help champion this cause and recruit others to do so.

Educating About Oral Health

Education and activities focusing on oral health awareness and disease prevention can make a significant impact on oral health practices and behaviors. Raising awareness and empowering patients to improve their own home care is crucial.

CONCLUSION

A wide range of medical problems can affect our patients. This course has considered a select group of the most frequently occurring diseases and conditions and the manner which treatments can influence the course of dental care. Clinicians should consider all of the unique health issues of each patient to allow for safe and efficient treatment. The goal is to achieve optimal oral health, thus enhancing overall health. This begins with a concerted effort between the patient and the caregiver. When medical problems exist, the physician and other involved healthcare professionals should be consulted, as these diseases can affect the safety and efficacy of dental treatments. This unified approach should assist patients to maintain optimal oral health and a high quality of life. ■

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Questions

- An increasingly important group failing in oral health is:**
 - Children
 - Adults
 - Middle aged people
 - Older people
- Some of the systemic diseases to which oral infection are linked include:**
 - Cardiovascular disease
 - Adult onset diabetes
 - Arthritis
 - All of the above
- The number of Americans older than 85 years of age by the year 2040 will be:**
 - 6.3 million
 - 10.2 million
 - 14.6 million
 - 17.8 million
- Over 25% of people aged 65 to 74 have severe periodontal disease.**
 - True
 - False
- Healthcare professionals must be able to provide education and training regarding:**
 - Relationship between oral health and general health
 - Importance of daily oral care
 - Means to provide basic oral care
 - All of the above
- In treatment planning, the focus should be on establishing a level of care appropriate to maintaining oral and general health.**
 - True
 - False
- Oral health challenges include:**
 - Financial
 - Medical
 - Access to dental care
 - All of the above
- What is the primary obstacle in obtaining dental care?**
 - Medical problems
 - Transportation
 - Financial
 - None of the above
- In order for cavities to develop, what interrelated factors must occur?**
 - Patient's diet must consist of repeated digestion of refined carbohydrates
 - Disease resistance is decreased
 - Specific bacteria must be present in dental plaque
 - All of the above
- Factors of patients who are at risk for cavity development include:**
 - Lower income
 - Physically compromised individuals
 - Living in a high caries family
 - All of the above
- Maintaining optimal periodontal health may do more to reduce healthcare expenditures in one's remaining lifespan than any other public health measure.**
 - True
 - False
- Effective brushing and flossing are essential to maintaining periodontal health and minimizing the development of cavities, but persistence and an average degree of dexterity are required.**
 - True
 - False
- Some of the normal aging changes of the oral cavity include:**
 - Outer surfaces of the teeth begin to wear
 - Teeth darken
 - Gums recess
 - All of the above
- Daily oral hygiene care should include:**
 - Use of fluoridated toothpaste
 - Brushing twice a day
 - Denture and soft-tissue care
 - All of the above
- Oral health champions include:**
 - Case manager
 - Direct care provider
 - Receptionist
 - All of the above

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Objectives

November 2019

1. Describe the state of oral health for older Americans.
2. State four dangers of poor oral health.
3. State three things patients should do to maintain/improve their oral health.

Answers

Please indicate your answer by filling in in the letter:

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