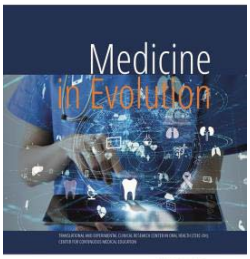
Management of Dental Care for Elderly Patients



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Abstract

Geriatric dentistry is a specialized field within dentistry focusing on the oral healthcare needs of the aging population, particularly those individuals experiencing chronic physiological, physical, and/or psychological changes or morbid conditions/diseases. The World Health Organization (WHO) has highlighted the importance of adopting 'active ageing' policies and programs to enhance the health, independence, and productivity of older adults. The imperative to plan and implement such initiatives is underscored by the WHO's assertion that "the time to plan and act is now". This review aims to provide an overview of age-related changes affecting the oral cavity and to explore interdisciplinary approaches for the treatment and prevention of oral diseases and disabilities among the elderly. The main aim of the research is to evaluate the management of elderly patients in dental medical services and to find solutions to improve case management for them.

Keywords: geriatric dentistry, oral health, patient management, active aging, dental health services

INTRODUCTION

The process of aging often brings about significant changes in the oral cavity, contributing to a higher prevalence of oral diseases among elderly individuals. These changes encompass various aspects of dental health, including alterations in tooth structure and morphology. It's common for aging teeth to exhibit diminished translucency and surface detail, which can impact both aesthetics and functionality [1-5]. Furthermore, the internal structure of teeth undergoes transformation, characterized by the formation of secondary dentin and the development of pulp stones, often leading to a reduction in the size of the dental pulp and potential sclerosis of root canals [6–8].

Periodontal health also tends to deteriorate with age, with conditions such as gingival recession becoming more prevalent. This recession exposes root surfaces, making them more susceptible to decay, contributing to a higher incidence of root surface caries among the elderly population [6,7,9].

The oral mucosa undergoes notable changes as well, manifesting as thinning, smoothness, dryness, and an increased vulnerability to ulceration [7]. These alterations are often accompanied by modifications in mucosal immunity, which can result in delayed wound healing and tissue regeneration [6]. Additionally, age-related changes in taste perception may occur due to factors such as the loss of filiform papillae on the tongue, mucosal atrophy caused by nutritional deficiencies, and decreased salivary secretion [6,7,10].

Structural changes within the oral cavity are also observed, including mandibular protrusion, alterations in dental occlusion, and changes in facial profile resulting from tooth extractions and alveolar bone atrophy [6,7,10]. These structural changes may be accompanied by progressive resorption and muscular atrophy of the mandible and masticatory muscles, as well as potential arthritic degeneration of the temporomandibular joint [6,7,10].

Understanding the intricate relationship between oral and general health is crucial for providing comprehensive care to geriatric patients. Oral health plays a significant role in various aspects of overall well-being, including functional, psychological, and economic aspects of quality of life. The oral cavity serves as a potential gateway for microbial entry, with oral bacteria implicated in systemic infections such as endocarditis and aspiration pneumonia [7,11–15]. Moreover, periodontal disease has been associated with an increased risk of cardiovascular diseases, attributed to the release of inflammatory cytokines from oral inflammation [7,11–15].

Conversely, systemic conditions may manifest with oral manifestations, serving as early indicators of underlying diseases. Elderly individuals exhibit heightened susceptibility to various oral diseases and conditions, including benign and pigmentary disorders, adverse drug effects, and infectious (fungal, viral, eg: Herpes simplex and Herpes zoster) and autoimmune conditions (eg lichen planus erosive, pemphigus vulgaris, pemphigoid) [6,7,10,17,18]. Recognizing and addressing these complex relationships requires interdisciplinary collaboration and a comprehensive understanding of the unique oral healthcare needs of the elderly population.

Table 1. Therapeutic considerations in relationship with the pathology of the elderly patients

Pathology of the elderly patient	**Therapeutic considerations**
Oral Cancer	Surgery, chemotherapy, radiation therapy Traumatic injuries Oral rinses (lidocaine HCl viscous 2%, diphenhydramine elixir 12.5 mg/5 Ml, diclonine HCl 1%, sucralfate), systemic drugs (penicillin, amoxicillin, erythromycin 500 mg qid)
Candidiasis	Topical agents (clotrimazole troches 10 mg 5 times a day, nystatin oral suspension 500,000 units, nystatin pills 100,000 units), systemic agents (fluconazole 100 mg, itraconazole oral suspension 10 mg/ml, ketoconazole 200-400 mg per day)

Xerostomy (Dry mouth)	Preventive therapy (topical fluorides, maintenance of oral hygiene), salivary substitutes (increased consumption of water, oral rinses and gels, use of artificial saliva), salivary stimulants (chewing gum or sugar-free mints, electrical stimulation, use of drugs such as sodium chloride pilocarpine, bromhexidine and cevimeline)
Oral bullous vesiculo and erosive disease	Pain control measures: viscous lidocaine 2% (swish and spit 5 ml, 4-5 times a day), liquid diphenhydramine (swish and spit 5 ml, 4-5 times a day), combination of viscous lidocaine, diphenhydramine and a coating agent (such as kaopectate or Maalox) in a 1:1:1 ratio, benzidamine diclonine hydrochloride 0.1%, systemic analgesia) Supportive care (hydration, ice chips or popsicles, bland diet , antipyretics such as ibuprofen as needed) Systemic drugs (prednisolone 5 mg dose or maintenance dose, azathioprine 50 mg 1-2 tablets)
Periodontal diseases	Daily brushing and flossing after each meal, electric toothbrushes, dental floss holders, pulsating water jet irrigators, antimicrobial rinses with chlorhexidine 0.12%, systemic antimicrobial therapy (metronidazole, tetracycline, clindamycin), surgical periodontal therapy
Neuropathic pain like burning mouth syndrome	Antidepressants (amitriptyline, trazodone, paroxetine), anticonvulsants (clonazepam, gabapentin), C-fiber nociceptor desensitizer (capsaicin), antioxidant (alpha-lipoic acid), alternative therapies (electroconvulsive therapy, cognitive behavioral therapy, mind-body interactions, changes of diet and lifestyle)
edentulous	Prevention of total tooth loss, fabrication of prostheses with adequate retention, occlusion, esthetics and margin extensions, endosseous dentoalveolar implants, regular evaluations to reduce the risks of dental stomatitis, traumatic ulcers or hyperplastic tissue reactions are recommended

The incidence of oral cancer escalates with advancing age, with typical sites of malignancy in the elderly encompassing the tongue, lips, buccal mucosa, floor of the mouth, and posterior oropharynx. Squamous cell carcinoma accounts for approximately 90% of all oral cancers, while the remaining 10% comprise salivary, bone, or lymphoid cancers [6,19,20].

Patients undergoing long-term bisphosphonate therapy for metabolic bone diseases or osteoporosis may be susceptible to developing osteonecrosis of the jaw, commonly known as bisphosphonate-related osteonecrosis of the jaw [7,10,21,22]. Diabetes mellitus poses a risk for advanced periodontal diseases due to gingival microangiopathy, altered polymorphonuclear leukocyte function, and increased collagen breakdown [1,6,23].

Individuals with chronic gastrointestinal ailments may experience dental erosion [1]. Arthritis affects approximately 49% of individuals aged 65 and older, with osteoarthritis being the most prevalent form and rheumatoid arthritis primarily affecting women. Both conditions can impact the temporomandibular joint, leading to degenerative changes in the condyle [6].

Various medical conditions prevalent among the elderly, including neurological disorders (e.g., Alzheimer's disease, Parkinson's disease, multiple sclerosis), endocrine disorders (e.g., diabetes mellitus), and gastrointestinal disorders (e.g., reflux, ulcers), can affect smell and taste perception [6]. Dysphagia, a common complaint among older adults, may stem from neuromuscular disorders, environmental factors such as smoking, or surgical interventions for head and neck cancer [6]. Epidemiological studies indicate that orofacial pain, predominantly neuropathic in nature, constitutes a significant issue in the elderly population [1,6].

Dentists should be aware of advances in dental materials such as hybrid ionomer/resin and new treatment modalities such as dental implants (in patients with sufficient bone support) for diseases commonly encountered in geriatric patients. [7,10]

One of the primary obstacles in delivering both restorative and preventive dental care to the elderly population is the necessity to foster an understanding of the importance of regular oral healthcare [38]. Across the globe, older individuals often experience poor oral health, manifested by a high prevalence of tooth loss, dental caries, periodontal disease, xerostomia, and precancerous lesions/oral cancer [39]. The foundation of effective prevention

lies in the early detection of oral diseases, a goal that hinges upon establishing regular contact with patients.

The main aim of the research is to evaluate the management of elderly patients in dental medical services and to find solutions to improve case management for them.

MATERIAL AND METHODS

To address this issue in my undergraduate thesis, I opted to conduct a cross-sectional observational study focusing on various factors influencing the utilization of dental services among the elderly. These factors, whether directly or indirectly related to dental care utilization, were categorized into four main groups:

1) Factors related to illness and health: Oral health status – oral assessment; Studying discomfort due to dental problems; General state of health - comorbidities; Mobility, functional limitation - assessment of edentence, mastication problems.

2) Socio-demographic factors: Place of residence: urban/rural, lives alone or with family, how many rooms; Education; Profession; Age; Sex

3) Factors related to services: Accessibility; Behavior of the dentist; The attitude of the dentist; The price of the service; Service satisfaction, Shipping.

4) Attitudinal or subjective factors: Personal beliefs related to the need for regular check-ups at the dentist; The need for dental control perceived by the patient; The importance given to oral health by the patient; Fear and anxiety; Resistance to changing prostheses, old work or treatment methods; Perceived financial strain - due to the fact that it is not a free medical service; Doctor-patient satisfaction in relation to dental visits.

The study was carried out between September 1, 2023, and January 15, 2024 and was carried out in two stages. In a first stage, the evaluation of the patients plus an interview was carried out, held between September 1, 2023 and January 15, 2024 in the premises of the individual dental practice, so that in the second stage, the oral health education lesson would be taught, held in the last week of January 2024 in a company meeting room.

Resolution of periodontal disease can be achieved with appropriate interventional therapy and regular oral hygiene. Patients with bleeding disorders, extensive cardiopulmonary problems, and immunosuppression may be poor candidates for periodontal surgery; Local methods (extensive scaling/root planning), topical medications (antimicrobial and anti-inflammatory agents), and occasionally systemic medications (antimicrobial and anti-inflammatory agents) are preferred [Table 2]. [1,16,33,34]

Table 2. Characteristics of subjects

Variable	Batch distribution	
Age	Average age = 73,4 years ± 11,5 years Minimum age= 65 yrs Maximum age = 92 yrs	
65 – 74 yrs	46	52,87%
75 – 84 yrs	27	31,04%
above 85 yrs	14	16,09%
Masculine	42	48,28%
Feminine	45	51,72%
Urban	71	81,61%
Rural	16	18,39%

The sample was represented by a group of 87 elderly subjects between the ages of 63 and 88 who presented to an individual dental office. The mean age of the subjects in the target group was 73.4 years ± 11.5 years, with a minimum of 65 years and a maximum of 92 years.

The subjects were divided into risk age groups, respectively 65-74 years representing 53% (N=46), 75-84 years (N=27) and over 85 years (N=14). The predominant gender of the subjects in the target group was female 52% (N=45), although we can state that in terms of gender, the studied sample was a homogeneous one. Most of the patients were from the urban environment, 82% (N=71), because the analyzed practice was also located in the urban environment.

RESULTS

The existence of dental caries. Dental caries was found in 63 patients. Most were found in the 65-74 age group and in female patients (73.2% female versus 71.2% male). A study carried out in England showed that the prevalence of caries was 22%, and among those aged between 75 and 84 years, which is much less than in the subjects of the studied group, so we can say that it is necessary education of the population at all ages.

In all the patients included in the study, we observed the absence of at least 5 teeth, all of them missing the 6-year-old molars, thus we can state that all patients are partially edentulous.

Periodontal disease in the studied sample. Periodontal disease including gingivitis and periodontitis is a disease of the tissues (periodontal attachment and bone) that support the teeth [25]. The existence of periodontal disease was identified in 33.33% of the subjects selected in the studied sample, the highest proportion being found in subjects aged between 75 and 84 years.

Gingivitis refers to the inflammation and bleeding of the gums and, if left untreated, leads to periodontitis [26]. Periodontal disease was characterized as the 11th most prevalent disease in the world by the Global Burden of Disease Study (2016) [27]. Plaque accumulation has been identified as an important cause of periodontal disease because it causes gingivitis and a process of mild to moderate alveolar bone loss [28]. Gingivitis is observed in the majority of patients studied.

Oral cancer is an important cause or disability among adults and older populations in both high- and low-income countries. Oral cancer includes lip cancer, oral cavity cancer, pharyngeal cancer and is the eighth most common type of cancer worldwide [54]. Treatment for oral cancer is surgical, and surgical complications, surgical infections, and mortality may occur postoperatively. As evidenced by literature data, older patients, although they had more comorbidities. the complication rate was 23.2% versus 20.2% in the younger population and 27.7% versus 22.6% of minor complications [55]. The postoperative infection rate, as shown by another study in elderly patients, was 33.7%, of which 23.1% were surgical site infections, and pneumonia was identified in 14.9% of patients [56]. In patients over 70 years of age, survival was not significantly decreased compared to other age groups; however, several patients in this age group were unable to receive or complete adequate adjuvant therapy. Therefore, oral cancer treatment must be individualized, taking into account the patient's performance status and comorbidities [57]. As can be seen from the table below, we encounter malignant or potentially malignant oral lesions in 20% of patients, most being in the over 85 age group.

We present below a synthesis of all these results of the research undertaken.

Table 3. Frequency of oral health programs by age group

Frequency of oral health problems by age group				
Variable		**65 – 74 years**	**75 – 84 years**	**Over 85 years**
The presence of dental caries	Count	45	20	8
	%	97,83%	74,07%	57,14%

The presence of periodontal lesions	Count	17	13	5
	%	36,96%	48,15%	35,71%
The presence of gingivitis	Count	31	18	4
	%	67,39%	66,67%	28,57%
Total population by age groups	Count	2	4	5
	%	4,35%	14,81%	35,71%
The presence of oral lesions	Count	3	3	6
	%	6,52%	11,11%	42,86%

From the figure 1, a higher proportion of edentulous patients accuse a poorer quality of life, compared to non-edentulous ones (this includes patients with good dentures), $p< 0.03$.

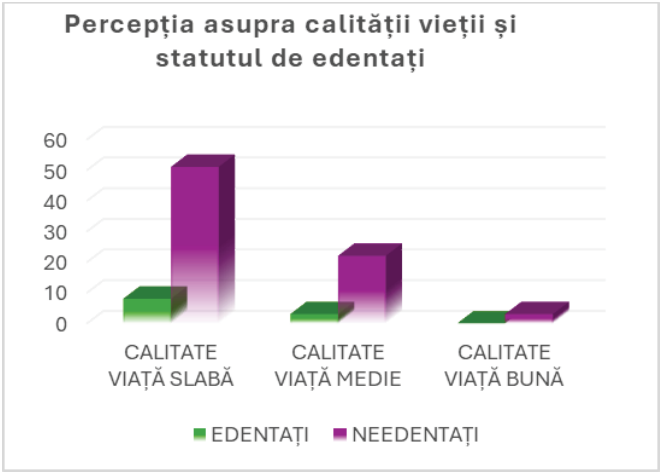

Figure 1. Perception about quality life and edentulous versus non-edentulous

People with untreated dental pathology reported the presence of dental pain, this being reported in 34.78% of people aged between 65 and 74 years with poor health.

Avoidance of certain foods due to dental pathology was reported in 74.07% of the elderly aged 75 to 84 years and in 41.30% of the elderly aged 65 to 74 years. Nutrient deficiency exacerbates chronic pathology in the elderly and they may become prone to sarcopenia and frailty [73]. Anorexia may develop in the elderly due to the combination of acute or chronic illness and poor confinement [74].

Table 4. Frequency of dental pain and avoidance of certain foods by age group

Frequency of dental pain and avoidance of certain foods by age group				
Variable		**65 – 74 years**	**75 – 84 years**	**Over 85 years**
The presence of toothache	Count	16	21	8
	%	34,78%	77,78%	57,14%
Avoiding certain foods due to dental or oral health problems	Count	19	20	12
	%	41,30%	74,07%	85,71%

The analysis of comorbidities in the target group shows the following distribution, the most common being cardio ischemic pathology (CIC), hypertension (HTA), diabetes (DZ) and cancer.

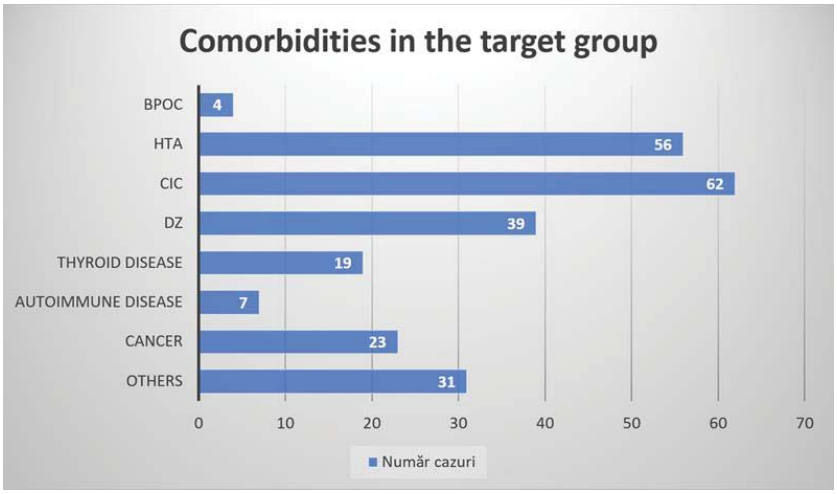

Figure 2. Comorbidities in the target group

DISCUSSIONS

According to the objectives set forth by the World Health Organization (WHO), one of the global aims for oral health is to achieve a 25% reduction in the prevalence of complete edentulism among individuals aged 65 and over. Additionally, the WHO advocates for the retention of at least 20 natural teeth as a benchmark for oral health. Consequently, the role of dentists in geriatric dentistry assumes heightened significance, particularly considering the substantial increase in average life expectancy observed over recent years [1,2,7,10].

The assessment of geriatric patients necessitates a comprehensive, multidimensional diagnostic approach that encompasses medical, psychosocial, and functional aspects. Such assessments are inherently multidisciplinary, designed to gather data on various facets of elderly patients' health and well-being [1,6,11,12]. Effective treatment planning for older adult's hinges upon a thorough understanding of the patient's overall health status and the interplay between systemic conditions and oral health [1,6,11,12].

Patients who have been diagnosed with any type of cancer should have a comprehensive dental examination, clinical and radiographic, completed as early as possible before any surgical and/or chemotherapy treatment. Reconstructive surgery may not be successful in restoring the patient to presurgical form and function. Physical therapy may be necessary to help patients adapt to an oral and maxillofacial environment that functions in a very different way. [17,18]

Oncologists and physicians should be aware that optimal oral health will minimize potential oral complications, such as mucositis, salivary gland dysfunction, osteoradionecrosis, etc., that may develop after surgery, radiation therapy, and chemotherapy. In addition, many patients do not receive routine preventive dental treatment and should be referred to a dentist before initiation of treatment. [6,30–32] It is imperative to extract teeth that cannot be restored or those with periodontal problems that they cannot be rectified.

Dental emergencies can occur at any time during cancer therapy. The patient's oncologist should be consulted before initiating any emergency dental treatment while the patient is receiving chemotherapy or undergoing radiation therapy. Laboratory values for platelets and white blood cells should be determined to assess whether the values are within an appropriate range for haemostasis and whether white blood cells are present in sufficient levels to successfully mount a defence against pathogenic organisms. Tooth extraction after oral radiation therapy can cause osteoradionecrosis. Dentures with any rough surface should

be smoothed. Those that fit poorly with the supporting tissues should be relined or redone. [1,6,31,32]

The dental treatment plan should aim to achieve optimal oral health. Regardless of functional status, elimination of acute dental infection and pain should be achieved for all elderly patients. Cosmetic and aesthetic dental services offer older generations an opportunity to improve their smile, boost their self-esteem and improve their quality of life in their later years. Many older adults have difficulty achieving effective daily plaque control. Various brush designs and handles are available for such patients, either manual or with motorized (electric or sonic) brushes. For patients with difficulty holding a toothbrush due to arthritis or stroke, devices are available to make brushing easier. Wider floss, Teflon-coated floss, floss holders, proximal brushes, and even electric floss are available. [6,7,10] For patients with gingivitis or gingival overgrowth secondary to drug use, chlorhexidine can be used. Older adults at high risk for caries may be placed on a course of chlorhexidine as an adjunct to therapy every 3-6 months. [1,6,7,10]

The presence of fluoride in toothpaste reduces the incidence of tooth decay, and a reduction is observed for every 500 ppm increase in fluoride concentration from 1000 to 2500 ppm.[10] In patients with severe caries, the incorporation of fluoride into glass ionomers used for Atraumatic Restorative Treatment (ART) is a useful secondary preventive measure to reduce recurrent dental caries. [7,10]

"Quality of life" includes many concepts such as health status, function and living conditions. Quality of life refers to the individual's perception of one's own health and this can be influenced by the culture and value system in which we live. The perception of quality of life is different between individuals and can change over time. it has a high impact on the quality of life. Tooth decay affects daily activities and social life. Impairment of oral function causes a decrease in self-esteem and reduces psychosocial well-being. Elderly people with edentulousness avoid social activities because they feel embarrassed to speak in front of others.

Edentation is the final stage of untreated caries or periodontal disease [58]. Edentacy is widespread throughout the world; it has been reported that in the elderly over 74 years, edentulousness can be found in 21.9% of individuals in the United States of America, in Sweden the prevalence of edentulousness among the elderly was 7% in 2000 [59,60]. The peak incidence of edentulousness is around 65 years of age, as demonstrated by most studies in developed and developing countries [61].

The prevalence of edentulousness in the general population is much lower than in the elderly, with a United States study of 432,519 adults showing a prevalence of 4.9% [61]. Pelter assessed the prevalence of edentulousness in the elderly (50 years) in India, Russia, China, Ghana, Mexico and South Africa. The prevalence of edentulousness was 16.3% in India, 9% in China, 21.7% in Russia and 8.5% in South Africa [62].

In Europe, numerous studies have evaluated the prevalence of edentulousness, in Sweden the prevalence of this disease decreased significantly from 19% in 1975 to 3% in 1997 [63]. The causes of tooth decay are complex. The main causes are the conditions produced by the harmful microbial role on oral health, there is also interaction with the genetic profile of the individuals, also edentation can occur as a consequence of iatrogenic, traumatic or therapeutic causes [64]. As we have shown in these paragraphs, tooth decay is common all over the globe, especially in the elderly, as our study also demonstrated, which revealed that 35.71% of people over 85 years old are toothless and need dentures, 14 .81% of subjects aged 75 to 84 and 4.35% of those aged 65 to 74.

CONCLUSIONS

Oral health plays a crucial role in the overall well-being and quality of life of older people. As people age, they may face unique oral health challenges and risks. Therefore, it is essential to prioritize oral health care for the elderly population to maintain their oral function, prevent discomfort and improve their overall health.

One of the main concerns for oral health in the elderly population is tooth decay. With age, the risk of tooth decay increases due to factors such as dry mouth, root exposure and dietary habits. Implementing preventive measures such as regular dental checkups, fluoride treatments, and dental sealants can help reduce the incidence of tooth decay and preserve natural teeth.

Another common oral health problem among the elderly is periodontal disease. Gingivitis and periodontitis can lead to gum inflammation, gum recession and even tooth loss if left untreated. Encouraging regular oral hygiene practices, such as proper brushing and flossing, along with professional dental cleanings can help prevent and manage periodontal disease in the elderly population.

Sialorrhea or xerostomia is common among older people and can have a significant impact on oral health. Medications, chronic conditions, and reduced saliva production all contribute to dry mouth. Adequate hydration, avoiding alcohol and tobacco, and using saliva substitutes can help alleviate dry mouth symptoms and protect oral tissues from infection and decay.

Proper denture care is essential for seniors who wear dentures. Dentures should be cleaned daily, removed at night and examined regularly for proper fit. Ensuring resources are available for denture repair and maintenance can help seniors maintain optimal oral health and prevent denture-related complications.

Oral cancer is a significant concern for the aging population, and early detection is crucial for successful treatment. Raising awareness of oral cancer risks, promoting regular oral cancer screenings, and educating people about self-examination techniques can help with early detection and prompt treatment of oral cancer.

Collaboration between health care providers, caregivers, and family members is vital to meeting the oral health needs of the elderly. Integrated care and regular communication can ensure comprehensive oral health management and enable timely intervention when needed.

In conclusion, prioritizing oral health care for the aging population is essential to maintaining their overall health and well-being. By addressing common oral health issues such as tooth decay, periodontal disease, dry mouth, denture care and oral cancer, we can help seniors enjoy healthy and comfortable oral function, improving their quality of life into the their golden age.

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