

## REBUILDING ORAL FUNCTION IN OLD AGE : THE SCIENCE OF GERODONTIC PROSTHODONTICS

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### ABSTRACT

The global increase in life expectancy has led to a rapidly growing elderly population, presenting unique challenges and opportunities for dental professionals. Gerodontology, a specialized field focusing on oral health care for older adults, plays a pivotal role within prosthodontics by addressing age-related anatomical, physiological, psychological, and systemic changes that influence prosthetic rehabilitation. This article explores the principles of gerodontology as applied to prosthodontics, emphasizing comprehensive assessment, treatment planning, and delivery of prosthetic care tailored to the geriatric population. Topics discussed include age-associated oral changes, prosthodontic treatment options, materials and techniques, systemic health considerations, maintenance protocols, and ethical aspects of care. Understanding gerodontological principles enables prosthodontists to enhance oral function, esthetics, comfort, and overall quality of life in elderly patients.

**Keywords:** Gerodontology, Prosthodontics, Geriatric dentistry, Elderly patients, Complete dentures, Implant-supported prostheses, Aging

### INTRODUCTION

Aging is an inevitable biological process characterized by gradual physiological, psychological, and social changes. Advances in medical science and public health have significantly increased human longevity, resulting in a demographic shift toward an aging population worldwide.

Consequently, dental practitioners are increasingly caring for elderly patients with complex oral and systemic health needs. Gerodontology is the branch of dentistry concerned with the study, prevention, and treatment of dental problems in older adults. Prosthodontics, which focuses on the restoration and replacement of missing teeth and oral structures, is closely intertwined with gerodontology.

Tooth loss, compromised oral tissues, reduced neuromuscular control, and systemic diseases are common in older individuals, making prosthodontic rehabilitation both challenging and essential. This article aims to provide a comprehensive overview of gerodontology in prosthodontics, highlighting the impact of aging on oral structures, considerations for treatment planning, available prosthodontic options, and the importance of maintenance and patient-centered care.

### AGING AND ITS IMPACT ON THE ORAL CAVITY

Aging affects the oral cavity through cumulative biological changes and long-term exposure to environmental and behavioral factors. These changes influence the prognosis and design of prosthodontic treatment.

#### Hard Tissue Changes

**Teeth:** Aging teeth often exhibit attrition, abrasion, erosion, discoloration, and increased brittleness. Secondary dentin deposition reduces pulp chamber size, decreasing sensitivity but complicating endodontic and restorative procedures.

**Alveolar Bone:** Progressive alveolar bone resorption following tooth loss is a hallmark of aging, especially in long-term edentulous patients. This resorption affects denture stability and retention.

#### Soft Tissue Changes

**Oral Mucosa:** Thinning of the epithelium, reduced elasticity, and diminished blood supply make the mucosa more susceptible to trauma and delayed healing.

**Salivary Glands:** Salivary flow may decrease due to age, systemic diseases, or medications, leading to xerostomia,

which adversely affects denture retention and patient comfort.

#### **NEUROMUSCULAR AND FUNCTIONAL CHANGE**

Reduced muscletone, impaired coordination, and diminished proprioception can compromise mastication, speech, and denture control. These factors must be carefully evaluated during prosthodontic rehabilitation.

#### **SYSTEMIC HEALTH CONSIDERATIONS IN GERIATRIC PATIENT**

Elderly patients frequently present with chronic systemic conditions such as diabetes mellitus, cardiovascular diseases, osteoporosis, arthritis, and neurodegenerative disorders. Polypharmacy is common, and many medications have oral side effects including xerostomia, altered taste sensation, and increased risk of candidiasis.

#### **PROSTHODONTIC TREATMENT PLANNING MUST ACCOUNT FOR:**

- \* Medical history and physician consultation
- \* Functional limitations and mobility issues
- \* Cognitive status and ability to maintain oral hygiene
- \* Nutritional status and masticatory efficiency

A multidisciplinary approach involving physicians, caregivers, and dental specialists is often necessary to ensure safe and effective care.

#### **PROSTHODONTIC TREATMENT PLANNING IN GERODONTOLOGY**

Successful prosthodontic rehabilitation in elderly patients requires individualized, realistic, and holistic treatment planning.

##### **Comprehensive Assessment**

- \* Detailed medical and dental history
- \* Clinical and radiographic examination
- \* Evaluation of oral tissues, residual ridges, and occlusion
- \* Assessment of patient expectations, motivation, and adaptability

##### **Treatment Objectives**

The primary goals of geriatric prosthodontics include:

- \* Restoration of masticatory function
- \* Improvement of speech and esthetics
- \* Preservation of remaining oral structures
- \* Enhancement of comfort and quality of life

Treatment plans should prioritize simplicity, longevity, ease of maintenance, and patient acceptance.

#### **PROSTHODONTIC TREATMENT OPTIONS FOR THE ELDERLY**

##### **Complete Dentures**

Complete dentures remain a common and economical solution for fully edentulous elderly patients. However, age-related ridge resorption and reduced neuromuscular control can compromise their success. Modifications such as neutral zone technique, monoplane occlusion, and soft liners may improve outcomes.

##### **Removable Partial Dentures (RPDs)**

RPDs are suitable for partially edentulous elderly patients, particularly when fixed prostheses are contraindicated. Proper design, stress distribution, and ease of insertion and removal are critical considerations.

##### **Fixed Dental Prostheses**

Fixed prostheses may be indicated in selected elderly patients with adequate periodontal support and oral hygiene capability. Conservative tooth preparation and material selection are essential to minimize biological risk.

##### **Implant-Supported Prostheses**

Dental implants have revolutionized geriatric prosthodontics by improving retention, stability, and patient satisfaction. Implant-supported overdentures are particularly beneficial for mandibular edentulism. However, systemic health, bone quality, healing capacity, and financial considerations must be carefully evaluated.

#### **MATERIALS AND TECHNIQUES IN GERIATRIC PROSTHODONTICS**

Material selection plays a significant role in the success of prostheses for elderly patients. Light weight, biocompatible, and durable materials are preferred. Advances in digital dentistry, CAD/CAM technology, and impression techniques have enhanced accuracy and reduced chair side time, benefiting patients with limited tolerance for lengthy procedures.

#### **MAINTENANCE AND AFTER CARE**

Prosthodontic treatment does not end with prosthesis delivery. Regular follow-up and maintenance are crucial, especially for elderly patients.

##### **Key aspects include:**

- \* Periodic recall visits

- \* Denture hygiene instructions
- \* Management of sore spots and tissue changes
- \* Relining or rebasing as required

### PSYCHOLOGICAL AND ETHICAL CONSIDERATIONS

Aging is often associated with emotional vulnerability, fear, and reduced self-esteem. Tooth loss and ill-fitting prostheses can negatively impact social interaction and mental well-being.

Prosthodontists must demonstrate empathy, patience, and effective communication.

Ethical considerations include informed consent, respect for patient autonomy, and realistic treatment recommendations that align with the patient's overall health and socioeconomic status.

### FUTURE PERSPECTIVES

With continued growth of the elderly population, the demand for geriatric prosthodontic care will increase. Ongoing research, education, and integration of digital technologies will further enhance treatment outcomes. Emphasis on preventive care and minimally invasive approaches will play a vital role in maintaining oral health in older adults.

### CONCLUSION

Gerodontology is an integral component of prosthodontics, addressing the complex needs of the aging population. A thorough understanding of age-related changes, systemic health considerations, and patient-centered treatment planning is essential for successful

Prosthodontic rehabilitation. By applying gerodontological principles, prosthodontists can significantly improve oral function, comfort, esthetics, and overall quality of life for elderly patients.

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