Oral Health for Independent Older Adults:
ADEA/GSK Predoctoral Curriculum Resource Guide
Foreword

The practice of dentistry is being significantly impacted by the growing older adult population within the United States. Oral health professionals will increasingly need to more effectively assess and diagnose oral problems, as well as skillfully provide a diverse and frequently complex range of preventive, restorative, prosthodontic, endodontic, periodontal, and surgical services to geriatric patients.

Understanding the important aspects of the actual delivery of dental services and maintenance of care of geriatric patients is essential to preparing future dentists to meet the oral health challenges facing our “graying” population. This Resource Guide is intended to support predoctoral dental education, highlighting the importance of comprehensive patient evaluation, the impact of basic science principles on aging, the impact of chronic disease and its treatment, and some of the socio-demographic factors that affect an older person’s quality of life. The focus is on the vast majority of older Americans who are living independently and experience a variety of modulating factors on their general and oral health.

Recognizing that dental schools organize curricula in unique ways, the themes of the Resource Guide are designed to assist faculty in achieving specific educational goals regarding the aging population while providing suggestions for learning objectives, content topics, and resources. The purpose of these themes is to complement and enhance instruction already underway.

Theme 1: Demographic Aspects of Aging focuses on the demographic development of the United States and provides the basis for understanding characteristics of the aging population. This background information is necessary to understand contemporary trends in the growth of the older population, health status, older patient perspectives and expectations, aging policy, and ultimately their impact on oral health care. It is a basic building block for understanding the needs, desires, and characteristics of aging in society while setting the framework for understanding future population changes.

Theme 2: Aging Process and Common Systemic Conditions addresses the impact of physiologic and physical changes associated with age, as well as conditions and diseases common to older adults, including management concerns specific to the aging population. Knowledge of the processes associated with human aging are a necessary tool for appropriate diagnosis and management of older adults. Disease often presents differently (sometimes silently) in older adults than in younger ones. While many systemic conditions exhibit themselves in older adults, there are many specific diseases and conditions that are of primary concern when dentists perform dental treatment on geriatric patient populations.

Theme 3: Normal Aging of the Oral Complex focuses on normal aging patterns of the oral complex, the results of these changes, and the ability to distinguish between normal aging and pathology. Along with an increase in the population of older adults, there has been an increase in those seeking to preserve and maintain their oral and dental health. A number of predictable changes in the oral complex must be understood when providing the older adult with comprehensive dental care. The oral health care professional of today and tomorrow will treat an ever-increasing number of older adult patients who differ from older cohorts of the past. The new elderly have more of their own teeth, visit the dentist more often, and demand more sophisticated care.

Theme 4: Common Oral Conditions of Older Adults focuses on oral conditions of the aging population. Oral disease in an aging population is characterized by a) a variety of general...
patterns of disease seen in a younger population, b) a variety of diseases, c) consequences of disease treatment, and d) environmental and habitual behaviors that are unique to the aging population. On a continuum across the lifespan, there is a period of transition between health and disease, as well as a continuum of health and disease across time. A lifetime of oral functioning and disease experience provides an opportunity to understand oral disease in the context of aging.

**Theme 5: Social Aspects of Care in Older Adults** aims to address various social, behavioral, economic, and organizational factors that may affect treatment planning and clinical decision making in the oral health care of elders. Provision of quality oral health care to elders is dependent on a thorough knowledge of the medical and systemic health status of the patient. Appropriate diagnosis, planning, and care are grounded in the clinician’s knowledge of basic biologic and pathophysiologic processes. However, such biologic knowledge is not enough. To best manage the oral health care needs of elders, a clinician must have knowledge of various nonbiologic or social determinants of health.

**Theme 6: Delivery and Maintenance of Care for Older Adults** focuses on factors and issues integral to the planning, provision, and maintenance of dental care services to the elderly. Recognition of these key concepts will assist students to effectively and efficiently deliver evidence-based dental care to their older adult patients.

**Patient Cases** complement the concepts outlined in Themes 1 through 6 and reflect issues likely to be experienced when treating the independent older adult. The complexities of the cases vary intentionally. They may be modified and adapted to meet the particular needs of a dental education program, faculty, and students.

**Innovative Practices** by peers in predoctoral dental education programs also have been included to demonstrate some of the excellent and innovative approaches being used to educate dental students in geriatric dentistry. These examples may encourage the implementation of similar learning opportunities.
Acknowledgements

This project was made possible as a result of generous financial support from GlaxoSmithKline. ADEA would like to thank GlaxoSmithKline for its support of this important project. In addition, ADEA would like to thank Dr. Ronald L. Rupp, Senior Manager, Professional Relations, GlaxoSmithKline, for his work with and contributions to the Advisory Committee.

ADEA would like to thank the members of the ADEA/GlaxoSmithKline Advisory Committee for the Development of a Core Curriculum for Older Adults for their commitment and dedication to sharing their expertise in creating this resource. Members of the Advisory Committee include:

Marsha A. Pyle, D.D.S, M.Ed. (Chair)
Associate Dean
Case School of Dental Medicine

Douglas B. Berkey, D.M.D., M.P.H., M.S.
Professor
University of Colorado School of Dentistry

Diane E. Ede-Nichols, D.M.D., M.H.L.
Chair, Community Dentistry
Nova Southeastern University College of Dental Medicine

Professor
University of Iowa College of Dentistry

Chair, Health Policy and Health Services Research
Boston University Goldman School of Dental Medicine

Karen M. Hart, M.A.
Director, Council on Dental Education and Licensure
American Dental Association

Robert Todd Watkins Jr., D.D.S.
Assistant Professor
University of North Carolina at Chapel Hill School of Dentistry

Janet A. Yellowitz, D.M.D., M.P.H.
Associate Professor and Director, Geriatric Dentistry
University of Maryland Baltimore College of Dental Surgery

ADEA and the Advisory Committee would like to thank all of the individuals who provided comments and critiques on the draft themes and cases. The Advisory Committee used the comments in making additions and modifications to the initial document. While the final decision to make any of the suggested changes was left to the Advisory Committee, ADEA is grateful to all who provided comments. Finally, ADEA would like to thank the dental schools and individuals who submitted descriptions of innovative models in geriatric dentistry. The innovative models are an integral component of this resource and serve to demonstrate some of the unique ways in which dental schools are currently incorporating geriatric dental education into the predoctoral curriculum.
# Table of Contents

Theme 1: Demographic Aspects of Aging ................................................................. Page 9
Theme 2: Aging Process and Common Systemic Conditions ................................ Page 13
Theme 3: Normal Aging of the Oral Complex ....................................................... Page 21
Theme 4: Common Oral Conditions in Older Adults ......................................... Page 25
Theme 5: Social Aspects of Care in Older Adults ................................................. Page 31
Theme 6: Delivery and Maintenance of Care for Older Adults ............................ Page 35

Patient Cases ........................................................................................................ Page 43
  Julia Lingarten ................................................................................................. Page 45
  Don Snagle ...................................................................................................... Page 49
  John Stanek ..................................................................................................... Page 53
  Ms. Sharp ......................................................................................................... Page 57
  Mrs. K .............................................................................................................. Page 61
  Mrs. Miriam Brodsky ...................................................................................... Page 65
  Mr. JG ............................................................................................................ Page 73
  Mrs. SW .......................................................................................................... Page 75
  Mrs. M. .......................................................................................................... Page 77
  Mr. J. ............................................................................................................. Page 81
  64-Year-Old Woman ...................................................................................... Page 85

Innovative Models in Geriatric Dental Education ............................................... Page 89
  Comprehensive Interdisciplinary Geriatric Dentistry Curriculum ................. Page 91
  Interdisciplinary Geriatric Oral Health Website ............................................ Page 95
  An Interdisciplinary Model for Community-Based Geriatric Dental Education:
    The Colorado Total Longterm Care Dental Program .................................. Page 99
    Geriatric and Special Needs Program (Geriatric Mobile Unit and Special Care
    Clinic) ............................................................................................................ Page 103
    Certificate in Geriatric Dentistry .................................................................. Page 105

Additional Resources ......................................................................................... Page 107
Theme 1: Demographic Aspects of Aging

Goal

The goal of this theme is to provide students with an understanding of population characteristics as they have evolved in the United States over the last century. Awareness of the developmental growth will help students understand trends in sociodemographic characteristics that affect the current and future health, social, and financial status of the older adult population.

Learning Objectives

The student will be able to:

The Geriatric Population in the Context of Society

1. Identify the major factors that have contributed to population increases and changes in age distribution during the last century.
2. Understand the changes in health, patterns of social participation, religiosity, level of life satisfaction, standards of living, and educational attainment throughout the 20th century that have impacted population demographics. Examine the impact of these factors on the general and oral health status of older adults.
3. Describe gender, ethnic, and cultural influences on health and dental health characteristics in aging populations.
4. Characterize the living arrangements of the older population by gender and type of housing.
5. Describe the relocation and migration patterns of the older population.
6. Describe the economic condition of the older population, including financial status, sources of income, distribution of expenditures, and poverty levels.
7. Define and differentiate between life expectancy and life span and identify the maximum life span.
8. Describe the average life expectancy at birth and at ages 65, 75, and 85.

The Geriatric Population in the Context of Quality of Life

1. Describe factors that contribute to quality of life in aging.
2. Describe ways that oral health contributes to quality of life in aging.

The Geriatric Population in the Context of Health Care

1. Compare the impact of contemporary health status data with early 20th century population data to explain changes in general health over time.
2. Discuss the impact of living arrangements and geographic location on health care utilization.
3. Describe the impact and implications of aging as a women's issue.

Geriatric Population in the Context of Oral Health Care

1. Discuss the impact of the population age distribution changes during the 20th century on the need for various types of dental care.
2. Understand how population trends may impact dental service delivery to the older population in the future.
3. Apply population demographic information to practice planning and care delivery.
4. Compare the patterns of dental care utilization across age, racial, and ethnic groups and historically among older adult cohorts.
5. Differentiate between dental service utilization patterns of older adults and persons from younger age groups. Describe the pattern of oral health service utilization of young adults to predict utilization of older adults.

Suggested Resources

The Geriatric Population in the Context of Society


The Geriatric Population in the Context of Quality of Life


**The Geriatric Population in the Context of Health Care**


**The Geriatric Population in the Context of Oral Health Care**


Web Resources (Additional)

Theme 2: Aging Process and Common Systemic Conditions

Goal

A hallmark of aging is that physiologic changes occur at varying rates in different people. This accounts for the heterogeneity that can be seen across individuals in an aging population. As a result of numerous age-related changes, disease in older adults often presents differently than in younger adults—and sometimes silently. The goal of this unit is to provide students with an understanding of common age-related physiologic changes and their impact on the older adult population. An additional goal of this unit is to discuss common treatment management concerns of older adults.

Learning Objectives

The student will be able to:

Aging Concepts and Definitions

1. Describe the process of physiologic aging.
2. Describe and differentiate chronologic age and functional age.
3. Define and describe the use of functional definitions to describe the aging population.
4. Define ageism and its impact on the health care system.
5. Discuss the concept of age-related decline in organ system reserves.
6. Discuss key biologic theories of aging.
7. Define and describe the use of Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL).

Health History and Physical Assessment

1. Discuss age-related pathophysiology of diseases and conditions common to older adults.
2. Discuss the concept of disease chronicity and multiplicity in an older population.
3. Discuss medical history-taking in older adults, including accuracy, informed consent and refusal, and the role of caretakers.
4. Describe how the range of “normal limits” changes in conditions common to older adults.
5. Describe the implications of concurrent medical conditions (co-morbidities) on older adults compared to younger adults.

Integument and Musculoskeletal Issues

1. Discuss the age-related changes in body composition (fat, water, subcutaneous tissues) and the impact of changes to the individual.
2. Describe the age-related changes of subcutaneous tissue, the impact on thermoregulation, and implication to older adults in the dental office.
3. Describe the age-related changes of skin and their impact on appearance and risk for tears.
4. Describe the relevance of skin tears and bruising in older adults.
5. Discuss the prevention of skin tears and bruising in older adults.
6. Describe age-related physiologic changes of bone.
7. Describe age-related physiologic changes of muscle.
8. Describe degenerative joint disease (osteoarthritis) and rheumatoid arthritis in older adults.
   a. Discuss the incidence and prevalence.
   b. Discuss how they affect access to dental care.
   c. Discuss how they can affect oral home care.
   d. Discuss the impact of medications used for disease management.
9. Differentiate between degenerative joint disease (osteoarthritis) and rheumatoid arthritis.
10. Discuss the most common types of joint replacement provided to older adults.
    a. Discuss antibiotic protocols for invasive dental procedures.
11. Describe osteoporosis in older adults.
    a. Discuss the incidence, prevalence, and gender differences.
    b. Discuss how it predisposes adults to bone fractures.
    c. Discuss the correlation between bone fracture and mortality.
    d. Discuss prevention and treatment modalities.
12. Describe the mechanism and presentation of kyphosis in older adults.
    a. Describe ways to modify the dental practice to address kyphosis.
13. Describe preventive approaches to reduce bone loss in older adults.
    a. Describe the use of bisphosphonates and management of oral complications associated with their use.
14. Discuss the impact of aging on exercise physiology and its importance in assisting older adults in maintaining independence and good oral health habits.

Gastrointestinal, Metabolic, and Nutritional Issues

1. Describe the physiology and presentation of age-related gastrointestinal changes.
2. Discuss changes of secretions and digestion in older adults.
3. Describe common age-related changes in the sensory mechanism that impact eating, chewing, and speaking in the elderly (e.g., speech and dysphagia secondary to stroke, head and neck cancer, and neural-motor diseases).
4. Describe age-related changes in the nutritional needs of older adults.
   a. Discuss the decline in muscle mass and need for fewer calories.
   b. Discuss age-related nutrient absorption changes.
5. Describe the signs and symptoms of common nutrient deficiencies in older adults.
   a. Discuss factors that influence food choices for the elderly.
   b. Discuss nutrition counseling techniques appropriate for geriatric dental patients.
   c. Outline dietary therapy for adequate nutrition in older patients.
   d. Describe the most commonly observed nutrient deficiencies and their signs and symptoms.
   e. Discuss multivitamin recommendations for older adults, including geriatric dosages.
6. Describe malabsorption syndromes.
   a. Discuss organ dysfunction and nutritional intake.
   b. Discuss the impact of malnutrition on general and oral health.
   c. Discuss the impact of masticatory dysfunction on malnutrition (e.g., denture pain).
7. Discuss the impact of oral health status on nutritional health.
8. Describe the impact of aging on metabolic rates, including thyroid function and related hormones.
9. Describe diabetes mellitus, including multisystem effects, management, and the contribution to oral conditions.
Cardiopulmonary Issues

1. Describe the physiology and presentation of age-related cardiac changes, including cardiac output and reduced blood flow.
2. Describe the etiology and prevalence of arrhythmias associated with older adults.
   a. Discuss the need of antibiotic prophylaxis.
3. Discuss heart murmurs in older adults.
   a. Discuss the need for antibiotic prophylaxis.
   a. Discuss disease progression and multisystem effects.
   c. Discuss use of dental medications during invasive treatment and their potential adverse effects.
5. Describe myocardial infarction (MI) and angina.
   a. Discuss disease progression and multisystem effects.
   c. Discuss use of dental medications during invasive treatment and their potential adverse effects.
6. Describe medical emergency techniques for identifying, resuscitating, maintaining, and escalating care for patients experiencing angina and MI in the dental office.
7. Describe the physiology and presentation of age-related vascular changes.
   a. Discuss the impact of peripheral and diminished blood flow.
   b. Discuss atherosclerosis and plaque formation.
   c. Describe the impact of impaired blood flow to gingival disease and healing.
8. Discuss blood pressure norms for older adults and guidelines to provide or deny oral treatment.
9. Describe the presentation of hypertension in older adults.
   a. Discuss antihypertensive agents and their side effects.
10. Describe stroke (cerebrovascular disorder).
    a. Discuss the differential diagnosis between hemorrhagic stroke and ischemic-thrombotic cerebrovascular disease.
    b. Describe the onset, progression, and management of a stroke.
    c. Discuss pharmacologic agents affecting the clotting cascade and platelet function (Coumadin, heparin, aspirin, Plavix).
    d. Discuss post-stroke management (sensory dysfunction, taste abnormalities, loss of motor control).
11. Describe the primary risk factors causing cardiopulmonary stress and strain on the heart.
    a. Discuss how the impact of stress can be reduced.

Respiratory System

1. Describe the physiology, presentation, and primary effects of age-related respiratory changes.
   a. Discuss the impact of these changes to morbidity and mortality.
2. Describe the age-related physiologic changes affecting swallowing.
   a. Discuss the impact of these changes on inefficient cough and aspiration pneumonia.
Renal System

1. Describe the physiology and presentation of age-related renal changes in reserve function and creatinine clearance and their implications in the provision of oral health care.

Nervous System

1. Describe age-related changes of the nervous system.
2. Describe the prevalence of trauma and injuries due to age-related motor loss.

Sensory Changes

1. Describe age-related changes to vision.
   a. Discuss color perception, dark adaptation, glare, depth perception, peripheral vision, and accommodation.
   b. Discuss strategies to modify office design to reduce the impact of limitations associated with age-related visual changes.
2. Describe common age-related visual disorders, including glaucoma, cataracts, and macular degeneration.
   a. Discuss the role of visual disorders as a symptom of systemic disease.
   b. Discuss how visual disorders affect patient communication and informed consent.
3. Describe age-related changes to hearing.
   a. Discuss the cause and impact of presbycusis and hearing loss.
   b. Discuss approaches to modifying voice quality and speed when speaking with a hearing-impaired individual.
   c. Discuss the utility and mechanism of lip reading in dental practice.
4. Describe age-related hearing disorders, including pathologic and pharmacologic causes.
   a. Discuss patient communication for working with hearing-impaired older adults.
   b. Discuss the use and sensitivity of hearing aids.
   c. Describe approaches for working with individuals with hearing aids in dental practice.
5. Describe age-related changes in touch sensitivity, including limitations of dressing and writing.
   a. Discuss the role of limited tactile sensitivity on the provision of daily oral care.
6. Describe the physiology and presentation of age-related smell and taste changes.
   a. Discuss the relationship of smell and taste to quality of life.
   b. Discuss the relationship of smell and taste to nutritional status in older adults.
7. Describe age-related changes of pain threshold.
   a. Discuss the reduced need for local anesthesia for restorative oral care.
   b. Discuss approaches to assist elders in understanding that lack of symptoms does not preclude the possibility of disease.
8. Describe vestibular and balance disorders in older adults.
   a. Discuss causes of vestibular and balance disorders.
   b. Discuss strategies to help elders adjust to a change in position when leaving a reclined dental chair.

Cognitive and Psychological Concerns

1. Describe age-related physiologic changes and presentation of cognition and psychology.
2. Describe the physiology and presentation of age-related changes in learning and memory.
   a. Discuss the ability to retain newly acquired information.
   b. Discuss approaches to address age-related learning and memory changes.
3. Describe dementias including Alzheimer’s disease and non-Alzheimer’s dementias.
   a. Describe the differential diagnosis of common dementias in older adults.
   b. Discuss the etiology and progression of dementia.
   c. Discuss the effect of dementia on access to dental care and daily oral care.
   d. Discuss the role of caregivers in oral health.
   e. Discuss the role and responsibilities of dentists to educate and train caregivers.
   f. Discuss the impact of dementia on oral health.
   g. Discuss the impact of dementia on patient communication and informed consent.
4. Describe Parkinson’s disease in older adult populations.
   a. Discuss the impact of Parkinson’s disease on access to dental care and daily oral care.
   b. Discuss use of sedation.
5. Describe age-related physiologic changes and presentation of personality and mood.
   a. Discuss personality change not associated with aging.
6. Describe depression (and mood disorders) in older adults.
   a. Discuss the response of older adults to antidepressants.
   b. Discuss the concerns of elders regarding antidepressants.
   c. Discuss the role of loss of spouse and home in geriatric patient populations.
7. Describe dementias including Alzheimer’s disease and non-Alzheimer’s dementias.
   a. Describe the differential diagnosis of common dementias in older adults.
   b. Discuss the etiology and progression of dementia.
   c. Discuss the effect of dementia on access to dental care and daily oral care.
   d. Discuss the role of caregivers in oral health.
   e. Discuss the role and responsibilities of dentists to educate and train caregivers.
   f. Discuss the impact of dementia on oral health.
   g. Discuss the impact of dementia on patient communication and informed consent.
   a. Describe the differential diagnosis of common dementias in older adults.
   b. Discuss the etiology and progression of dementia.
   c. Discuss the effect of dementia on access to dental care and daily oral care.
   d. Discuss the role of caregivers in oral health.
   e. Discuss the role and responsibilities of dentists to educate and train caregivers.
   f. Discuss the impact of dementia on oral health.
   g. Discuss the impact of dementia on patient communication and informed consent.

Endocrine System Issues

1. Describe the physiology and presentation of age-related endocrine changes, including the ability to respond to periodontal or oral surgery and the impact of dehydration and medications.

Immune System and Infectious Disease

1. Describe the physiology and presentation of age-related immune system changes, including susceptibility and altered presentation of systemic oral soft tissue.
2. Describe the presentation of shingles, HIV, and tuberculosis in older adults.
   a. Discuss etiology and prevalence of each.
   b. Discuss the role of the dental team in identifying each disease or disorder.

Medication Use, Compliance, and Pharmacological Issues

1. Describe the use of medications (prescribed and over the counter) in older adults.
   a. Discuss compliance behavior and the ability to understand instructions.
   b. Discuss the role of personal finance on the decision to comply with drug regimens.
2. Describe common adverse drug reactions in older adults.
3. Discuss physiologic age-related changes that may impact drug distribution, absorption, metabolism, and excretion.

**Suggested Resources:**

**Aging Concepts and Definitions**


**Health History and Physical Assessment**


**Cardiopulmonary Issues**

Sensory Changes


Cognitive and Psychological Concerns


Immune System and Infectious Disease


Medication Use, Compliance, and Pharmacological Issues


Textbooks

Theme 3: Normal Aging of the Oral Complex

Goal

The primary goal of this theme is to provide the student with a sound knowledge base of the normal oral, para-oral, and dental structures of adults and to elucidate the impact of the normal aging process on these structures with regard to changes in morphology and function. In addition, a rationale for accurate diagnosis and ultimate treatment goals will be discussed.

Learning Objectives

The student will be able to:

Anatomy and Physiology of Circumoral Structures

1. Identify the circumoral structures and the anatomical and functional changes that occur with aging in each.
   a. Lips (vermillion border, epithelial surface, connective tissue, competence)
   b. Musculature (contractile force, endurance, mastication, swallowing)
   c. Mucous membranes, including epithelial layer and connective tissue layers

Normal Aging Patterns of the Adult Dentition

1. Enumerate the aging changes that occur in each of the structures of the teeth and identify risk factors for diseases of the following, including attrition, caries, and pulp disease:
   a. Enamel
   b. Dentin
   c. Cementum
   d. Pulp

Normal Aging Patterns of Osseous and Periodontal Soft Tissue

1. Identify the anatomic and functional changes of the following with the normal aging process:
   a. Bone modeling and remodeling and the effects of age, including anatomic changes.
   b. Identify the influencing factors on bone modeling and remodeling.
   c. Identify the structures of the periodontium and describe the anatomical and functional changes that occur in each, including the gingiva and the periodontal ligament.
   d. Appreciate the age-related changes and their connection with overall systemic health

Temporomandibular (TM) Joint

1. Describe the anatomic and functional changes in the TM joint with aging.
2. Describe the signs and symptoms of TM joint dysfunction (TMD) in the aged.
3. Describe gender variation in prevalence of TM joint changes with aging.
Salivary Glands

1. Identify the anatomic changes of the salivary glands that occur with aging.
2. Understand the factors that influence salivary flow in the older adult.
3. Understand the functional characteristics of saliva and the concerns regarding changes as a result of alteration in secretion or composition in the older adult.

Taste and Smell

1. Identify changes in taste and smell associated with age.
   a. Effects of pharmacotherapeutic agents.
   b. Effects of salivary flow.
   c. Changes in tolerance and preference.
   d. Impact of the older adult’s medical status.
2. Describe the anatomical and functional tongue changes that occur with aging.

Suggested Resources

Anatomy and Physiology of Circumoral Structures


Normal Aging Patterns of the Adult Dentition


Normal Aging Patterns of Osseous and Periodontal Soft Tissue


**Temporomandibular Joint**


**Salivary Glands**


**Gustatory and Olfactory Mechanisms**


**Additional Resources**

Theme 4: Common Oral Conditions in Older Adults

Goal
The goal of this unit is to provide a foundational background of oral diseases and conditions that commonly occur in an aging population. A lifetime of oral functioning and disease experiences provides an opportunity to understand oral disease in the context of aging. Students will consider risk and characteristics of diseases as primary information and tools to manage oral disease in an aging population.

Learning Objectives
The student will be able to:

Disease Risk

1. Apply patient and population demographics to an understanding of dental disease risk in various cohorts of older adults.
2. Counsel patients regarding modifiable risk factors for oral disease.
3. Describe the causes of xerostomia and its impact on oral health in aging.
4. List the classes of drugs that cause dry mouth as a side effect.
5. List the medications that contribute to oral disease.
6. List the risk factors for oral soft tissue lesions and neoplastic disease.
7. Describe the risk factors for infectious oral diseases.
8. Discuss the nutritional factors that contribute to or are a consequence of oral disease.
9. Describe the impact of medical disease and its treatment on dental care.

Conditions of Teeth and Bone

1. Review and explain the mechanism of pathologic bone remodeling and physiologic modeling that occurs with tooth loss and its consequences for aging patients.
2. Apply the epidemiology of caries development in an aging population to risk assessment strategies.
3. List the oral and non-oral factors contributing to the development of root caries in older adults.
4. Describe the differences between coronal and root surface caries in older patients.
5. Describe the impact of coronal and root caries on the oral health of older adults.
6. Describe the characteristics of tooth abscesses in older adults.
7. Describe the anatomic and behavioral characteristics that contribute to the development of attrition, abrasion, erosion, and corrosion of teeth in older adults.
8. Discuss the causes of dentinal hypersensitivity in older adults.

Temporomandibular Joint (TMJ) Disorders

1. Describe the anatomic and functional TMJ changes with aging and variations by gender.
2. Describe the signs and symptoms of TM joint dysfunction (TMD) in the aged.
3. Explain the diagnostic criteria for TMD.
Mucosal, Soft Tissue, and Glandular Conditions

1. Recognize and develop a care plan for older adults with mucosal conditions that are drug-induced, prosthetic appliance-related, and systemic disease-related.
2. Discuss the signs and symptoms of candidal infections in older patients.
3. Describe the etiology of denture stomatitis.
4. Describe the characteristics of mucositis that is a result of medical therapy for head and neck cancer.
5. List the drugs that have a propensity for the development of lichenoid reactions.
6. Compare the etiology and clinical signs of erythema migrans with lichenoid drug reactions in older patients.
7. Investigate the role of inflammation and periodontal disease in systemic disease in older adults.
8. Understand the risks, signs, and symptoms of periodontal disease in older patients.
9. Recognize the signs and symptoms of disorders of the lips in older patients.
10. Describe common conditions of the tongue in older adults.
11. Describe common salivary gland disorders in an aging population.
12. Describe the etiology and characteristics of Sjogren’s syndrome, including its oral manifestations.
13. Describe the effects of common systemic diseases on oral mucosa, including:
   a. Diabetes mellitus
   b. Chronic renal failure
   c. Hyperparathyroidism
   d. Diabetes insipidus
   e. Sjogren’s syndrome
   f. Sarcoidosis
   g. HIV disease
   h. Hepatitis C and other liver diseases
   i. Psychogenic disease

Neoplastic Disease

2. Review the risk factors and common oral sites of squamous cell carcinoma in older patients.
3. Review the signs and symptoms of basal cell carcinoma in older patients.
4. Review patient counseling strategies for tobacco and alcohol use and cessation.

Suggested Resources:

Disease Risk Assessment


**Hard Tissue Pathophysiology**


**Temporomandibular Joint Disorders**


**Disorders of Soft Tissues**


**Neoplastic Disease**


**General Resource**

Theme 5: Social Aspects of Care for Older Adults

Goal

The goal of this module is to provide the student with an understanding of the contextual factors related to oral health care in elders, including knowledge about various interrelated topics regarding:

- the organization and financing of oral health care for elders;
- the impact of oral health disparities;
- patient-provider communication, including matters related to health literacy and cultural competence;
- patient-provider communication, as related to ethical issues regarding informed consent, respect, and autonomy;
- provider-provider communication, as related to interdisciplinary collaboration, referral, and consultation;
- treatment planning and patient management in the context of social supports and coordination of roles of multiple caregivers.

Learning Objectives

The student will be able to:

Sociological Aspects of Oral Health in Older Adults

1. Describe and explain key social theories of aging. These may include Disengagement Theory, Activities Theory, and Continuity Theory.
2. Explain the impact of family size, composition, and structure on the availability of informal caregivers, the role of the family as a source of support, and the sources of stress on family caregivers.
3. Discuss the impact of the quality of relationships between older persons and their children.
4. Discuss the impact of widowhood and divorce.
5. Describe the social characteristics of the older population, including education level, religion, patterns of social participation, and level of life satisfaction.
6. Describe the living arrangements of the older population. Understand the multiplicity and complexity of such living arrangements and their impact on care (e.g., growth in numbers of persons living alone, assisted living, gender differences in living arrangements, and the institutionalized older population).
7. Explain the relocation and migration patterns of the older population within the United States and of foreign-born elders immigrating to the United States.
8. Describe the economic condition of the older population, the impact of a fixed income, and the effect of competing priorities on access to oral health care.
9. Describe their sources of income and distribution of expenditures and the impact of poverty in the older population.
10. Discuss the importance of cultural variation and describe the role of cultural competence in ensuring appropriate access and use of oral health care services.
11. Discuss the impact of patient death and dying in a dental practice.
Utilization, Organization, and Financing of Oral Health Care Services

1. Describe the options available for financing dental care to persons who have reached age 65.
2. Describe the various private means by which elders can pay for oral health care (e.g., out of pocket, employer or retiree insurance plan with private dental insurance or health maintenance organization dental benefits).
3. Describe complementary or alternative medicine (CAM) strategies in oral health care.
4. Describe the various publicly supported means by which elders can pay for oral health care (e.g., role of private insurers and foundation- and dental society-sponsored programs, Medicare oral health benefits, Medicaid oral health benefits, other means-tested assistance programs, community health centers, and the U.S. Department of Veterans Affairs).
5. Describe the role of various not-for-profit and charitable community resources (e.g., state and district dental society access projects or volunteer projects, dental school and hospital-based clinics).
6. Differentiate among commonly used measures of utilization and describe the strengths and weaknesses of each.
7. Compare the patterns of dental care utilization across age groups and historically among older adult cohorts.
8. Discuss factors commonly associated with utilization of dental services as they apply to older adults.
9. Discuss strategies for improving utilization of dental services by various subgroups of the older adult population who may be underutilizers of dental care (e.g., the uninsured or underinsured, edentulous older adults).
10. Discuss issues of patient compliance with dental care and medications.

Attitudes and Behaviors of Health Professionals toward Older Adults

1. Identify the sociodemographics and epidemiology of aging (see Theme 1) in the United States and globally. Students should be able to identify, access, synthesize, and apply evidence-based resources for older Americans and compare and contrast with evidence derived from other developed nations as well as from developing nations.
2. Describe the concept of ageism as it applies to stereotyping elders, giving examples with the sociodemographic and health characteristics of older adults.
3. Describe examples of how information and attitudes may affect clinical assessments, clinical decision making, and recommendations for treatment of older adults.
4. Demonstrate the special communication skills necessary for older patients (e.g., differences due to socioeconomic classes, cultural background, disabling conditions, presence of caretakers).
5. Describe the role of oral health literacy of elders in affecting care decisions.

Community Health and Social Service Networks

1. Differentiate between formal and informal service networks designed for older adults and their families.
2. Describe the role of interdisciplinary teams in the care of older adults and the particular roles of the dentist in the interdisciplinary approach to care.
3. Recognize the differences between Medicare and Medicaid in terms of health and social services provided to people older than 65 and, in particular, the provision of oral health care services.
4. List and briefly describe the dental benefits available to older people in their communities under Medicare and Medicaid, noting specified federal requirements and the variations among states in Medicaid dental services for adults.
5. Describe the role of local, regional, and national nongovernmental organizations in providing health and social services to people older than 65.
6. Describe the typical eligibility criteria for community services (e.g., age, income, assets, residency status, health or functional status, geographic location).
7. Describe and discuss access barriers to oral health care (e.g., financing, health literacy, transportation, mobility).
8. List and briefly describe the major elements of a social history that may be specifically applicable for use with elders.
9. Based on social history and functional needs assessment, develop a customized plan for facilitating access to care for an elder patient.

Ethical and Legal Implications in Elders' Oral Health Care

1. Discuss how ethical principles apply to specific dental treatment of elderly patients.
2. Explain the factors that must be present for patients to fully exercise autonomy, including the importance and need to obtain and document informed consent and informed refusal.
3. Contrast autonomy and paternalism.
4. Discuss the conditions under which a patient may legally transfer autonomy to another person.
5. Describe essential features of patient competence and its relationship to establishing guardianship.
6. Identify and explain the ethical and legal factors associated with access to dental care by elders.
7. Identify the factors related to “responsible party” contracts.
8. Identify strategies to obtain informed consent and evaluate competency and clinical decision-making capacity in older adults.
9. Discuss the legal obligation to recognize elder abuse and for appropriate documentation and reporting mechanisms.

Suggested Resources


Symposium Proceedings contents:


Theme 6: Delivery and Maintenance of Care for Older Adults

Goal

The goal of this theme is to provide a knowledge base of factors and issues integral to the provision and maintenance of dental care services to the elderly. Recognition of these key concepts will assist students to effectively and efficiently deliver evidence-based dental care to their older adult patients.

Learning Objectives

The student will be able to:

Assessment and Diagnostic Concepts Pertaining to Geriatric Dental Patients

1. Discuss the importance of assessment of the elderly dental patient as it relates to treatment planning, patient management, dental care provision, and maintenance of oral health.
2. Describe key communication concepts and dental office environmental factors that may enhance patient access, assessment, and treatment outcomes.
3. List the various geriatric assessment components that the dental professional should perform prior to diagnosis, treatment planning, and dental care provision (e.g., medical, pharmacological, functional, psychosocial, physical examination).
4. Describe considerations important in assessing the elderly, including the accuracy of the self-report, language and translation issues, caretakers' roles, informed consent issues, etc.
5. Identify signs and symptoms helpful in the diagnosis of oral problems frequently experienced by the elderly (e.g., dental caries, periodontal and periapical pathology, mouth dryness, oral cancer).

Key Collaborations and Considerations Regarding Dental Care Provision to Geriatric Dental Patients

1. Describe the benefits of consulting with and referring to dental specialists when managing the dental needs of an older patient (e.g., oral cancer, deep-space head and neck infections, TMD, atypical disease presentations).
2. Discuss indications for physician consultations and effective communication strategies.
3. Identify the major duties of key allied health professionals capable of providing special expertise to assist the dental professional in the delivery of dental services to the geriatric patient (e.g., physician, social worker, physical therapist, occupational therapist, dietician, pharmacist, and elder law services).
4. Discuss the benefits and strategies regarding utilizing interdisciplinary teams in the maintenance and improvement of the oral health status of the elderly (e.g., benefits to include improved assessment or diagnostic outcomes, patient management, and compliance; strategies to include identifying available team resources and how best to interact with team members).
5. Describe the characteristic signs of elder abuse and the requirements, legal liability, and mechanism for reporting suspected cases.
6. Demonstrate how to perform patient transfers from a wheelchair to the dental chair.
Treatment Planning Issues Relating to Geriatric Dental Patients

1. Describe the concept of “rational dental care” and its application to care of older adults.
2. Discuss important treatment planning considerations that are frequently associated with older adults and how they may impact prognosis (e.g., medical, psychosocial, and other mitigating issues).
3. Relate the significance of identifying and discussing reasonable treatment options with the geriatric patient prior to finalization of the treatment plan.
4. Discuss differences in the oral health management of functionally independent, frail, and functionally dependent older adults.
5. Identify key patient factors that may impact the prognosis of dental procedures delivered to geriatric dental patients (e.g., operative dentistry, periodontics, endodontics, oral surgery, fixed prosthodontics, removable prosthodontics, complete dentures, implants).

Considerations Regarding Provision of Comprehensive Dental Treatment Procedures to Geriatric Dental Patients

1. Describe key concepts associated with treating coronal and root dental caries in the elderly (e.g., minimal intervention dentistry, choice of dental materials including glass ionomers, preparation design, and techniques for enhanced retention).
2. Discuss the treatment options for older patients who experience attrition, abrasion, and erosion or corrosion of the dentition.
3. Describe treatment options for older adults who experience dentinal hypersensitivity.
4. List the treatment approaches for patients experiencing TMD.
5. Describe key concepts associated with periodontal treatment interventions in geriatric patients (e.g., surgical vs. nonsurgical interventions, splinting mobile teeth).
6. Describe treatment approaches for older adults experiencing soft tissue abnormalities (e.g., lip/tongue/gingival disorders; drug/appliance/systemic disease-related conditions).
7. Describe key concepts associated with endodontic treatment interventions in the elderly (e.g., sclerosed canals, access preparations, types of files).
8. Describe key concepts associated with performing oral and maxillofacial surgery on the elderly (e.g., preprosthetic surgery, ankylosis, wound healing, biopsy, management of bleeding, alveolar ridge atrophy).
9. Describe initial treatment and management approaches for older patients who experience cancers of the head and neck.
10. Describe key concepts associated with performing fixed prosthodontic procedures on the elderly (e.g., location of crown margins, pontic design, restoring vertical dimension).
11. Describe key concepts associated with providing removable partial dentures for older adults (e.g., framework designs for terminal dentition, abutment tooth longevity).
12. Describe key concepts associated with performing complete denture procedures on the elderly (e.g., atrophic mandibular ridge, redundant tissue management, tissue conditioners, esthetics).
13. Describe key concepts associated with providing dental implants, implant overdentures, use of mini-implants, and site preparation to enhance reabsorbed ridges (e.g., indications or contraindications, advantages and disadvantages).

Preventive Dentistry Concepts Necessary for the Maintenance or Improvement of Oral Health in Geriatric Dental Patients

1. Discuss the prevention and treatment approaches to decrease oral disease risk in older adults.
2. Describe key elements of a comprehensive approach to dental caries prevention in an older patient population, including use of fluoride(s), amorphous calcium phosphate, chemoprophylactics, xylitol, and diet.

3. Discuss the principles of oral disease management for elderly patients with varying degrees of functional capabilities and disease status (e.g., post-stroke patients, dementia, Parkinson’s disease).

4. Demonstrate how to prescribe preventive agents and devices indicated for a preventive dentistry maintenance plan for the elderly (e.g., fluorides, antifungal medications, artificial salivas).

5. Discuss elements of an effective plaque control program for the elderly, including frequent brushing and flossing, toothbrush modification, use of electric toothbrushes, oral hygiene aides, and prosthesis protocols.

6. Explain management approaches for xerostomia and salivary gland hypofunction.

7. Outline dietary therapy for patients with dental conditions in which adequate nutrition is important.

**Suggested Resources**

**Assessment and Diagnostic Concepts Pertaining to Geriatric Dental Patients**


Key Collaborations and Considerations Regarding Dental Care Provision to Geriatric Dental Patients


Treatment Planning Issues Relating to Geriatric Dental Patients


### Considerations Regarding Provision of Comprehensive Dental Treatment Procedures to Geriatric Dental Patients


**Preventive Dentistry Concepts Necessary for the Maintenance or Improvement of Oral Health in Geriatric Dental Patients**


**Web Resources (Additional)**

Patient Cases

The following Patient Cases are designed to complement the concepts outlined in the objectives of Themes 1 through 6. They reflect issues likely to be experienced when treating the independent older adult. The format and complexity of the cases vary intentionally. These examples are not intended to serve as a comprehensive collection. Faculty members are encouraged to modify and enhance the scenarios to meet the particular needs of the dental education program and students.
Case: Julia Lingarten

Population:
This patient is an independent-living older adult.

Patient Photo:
*Insert photo prior to using case*

Description:
Ms. Julia Lingarten is a 71-year-old female who presents to the dental office for comprehensive care. She is concerned that she needs a lot of dental care since she has not been seen regularly in the last eight years. This is the first visit to your dental office for this patient. The patient states, “I have several teeth that I have lost, and now some of my teeth seem to have shifted a bit. I just need this all checked out.”

Patient Demographic Information:
Ms. Lingarten is a widow of 17 years. She lives in the home that she and her husband occupied until his death. Ms. Lingarten is a high school graduate and worked as a homemaker all of her adult life. Mr. Lingarten worked for the U.S. Postal Service for the 10 years prior to his death. Ms. Lingarten has a modest income of $16,000 per year, based on savings from her husband’s retirement benefits and life savings. She does not have any dental insurance benefits and will pay for her dental treatment out of pocket. Ms. Lingarten does not have any children but does have a nephew who lives 120 miles away within the same state. She lives by herself in the home she has occupied for 51 years in a town of 10,000 people in Ohio.

Medical History:
Ms. Lingarten has a medical history of hypertension. Her surgical history includes an appendectomy 48 years previously, an R hip replacement in 1999, and a re-replacement 14 months ago. She originally required the replacement due to a traumatic injury as a result of a car accident in 1999. She has had a few mobility difficulties ever since her original hip replacement. In 2005, she had a minor stroke with no residual functional deficits. She sees her physician every three months for blood pressure monitoring. She reports a history of seasonal allergies that seem the worst in late summer. The patient is allergic to amoxicillin. She has no other known drug allergies.

The following vital signs are recorded/reported today:
Weight: 289 lbs.
Height: 5’3”
Blood Pressure: 168/99
Respiration: 20/minute
Pulse: 80 beats per minute

Medications:
Hydrochlorothiazide
Losartan
Fluticasone propionate
Tylenol sinus prn
Antihistamine
Ibuprofen for occasional headaches

Social History:
Ms. Lingarten does not drive anymore, although she did when her husband was still living. Her neighbor brings her to her appointments and to the grocery store weekly. She and her lady friends get together once per week to play cards at each other’s homes, and she enjoys her weekly bingo game at the church. She is a nonsmoker and a nondrinker.

Dental History:
Ms. Lingarten takes daily care of her teeth because, she states, “They are important to me.” However, she has not been to the dentist recently (eight years) and believes it is time to get her teeth checked and repaired. She does have several missing teeth in posterior quadrants, evidence of periodontal disease, and multiple restorations that need repair.

Dental Chart:
Missing:
Teeth # 1, 2, 16, 17, 19, 30, 32

Restorations:
Teeth # 3 = MOD Amalgam
8 = M Composite
12 = DO Amalgam
18 = Bridge Abutment
19 = Pontic
20 = Bridge Abutment
24 = M Composite
28 = MO Amalgam

Decay:
Teeth # 9 = Distal
18 = Marginal decay
20 = Marginal decay
25 = Distal
29 = DO

Graphic Chart:
Red lines over roots represent periodontal pocket depths.
Radiographs:
*(Insert radiographs prior to using case)*

**Learning Issues:**
1. What are the patient's primary problems?
2. With respect to the identified medical problems, how will you proceed with patient care?
3. Under what conditions would you consult the patient's physician?
4. Does the patient require antibiotic premedication prior to dental treatment that causes bleeding? Why or why not?
5. What is the standard of care for premedication of patients with hip replacements?
6. What is the standard regimen for patients who have hip replacements?
7. How does the patient's drug allergy impact her premedication?
8. If the patient was not allergic to amoxicillin and was taking that drug for a dental infection, how would her premedication be impacted?
9. What are her primary dental problems?
10. How will you approach dental care for this patient?
11. What psychosocial issues impact this patient?
12. What medication side effects might this patient be subject to?
13. How will you deal with medication side effects?

**Learning Objectives:**
The student will be able to:

1. Discuss the importance of assessment of the elderly dental patient as it relates to treatment planning, patient management, dental care provision, and maintenance of oral health.

2. Discuss the principles of oral disease management for elderly patients with varying degrees of functional capabilities and disease status.

3. Compare the patterns of dental care utilization across age, gender, racial and ethnic groups, and historically among older adult cohorts.

4. Describe ways that dental treatment is impacted by systemic disease.

5. Describe how to prescribe preventive agendas and devices indicated for a preventive dentistry maintenance plan for the elderly.
Case: Don Snagle

Population:
This patient is an independent-living older adult.

Patient Photo:
(Insert photo prior to using case)

Description:
Mr. Snagle is a 66-year-old male who regularly visits the dental office for routine care. He has been a patient of the practice for many years. He has a full complement of teeth but has recently fractured #30 at the gingiva and is having discomfort. He makes an emergency appointment to see you today.

Patient Demographic Information:
Mr. Snagle is married with one child who recently graduated from college. He lives in a suburban community with his wife, who is a periodontist. Mr. Snagle is a college graduate and has his own commercial photography company in the city, which he started 30 years ago. He and his wife are in the 33% income tax bracket and have well-funded retirement accounts. His wife is a partner in her periodontal practice. He does not have dental insurance but has been a regularly attending patient all of his life. Mr. Snagle is active in his community, serving as a member of the board of directors of a summer camp for disadvantaged children.

Medical History:
Mr. Snagle has a medical history that is significant for a mechanical aortic valve replacement 11 years ago. He is on anticoagulant therapy for his valve replacement. Immediately after surgery, he noticed some lapses in his short-term memory; however, this has not affected his daily functioning. After his surgery, he had a period of depression for which he was treated with medication. His history is also positive for hypertension. He sees his physician on a six-month basis for laboratory tests for the anticoagulant therapy and for blood pressure checks. At his last visit, his physician informed him that he had a small abdominal aortic aneurysm beginning. There is no immediate danger, and he is to continue with his six-month checkups to monitor the status of the aneurysm. He has no known drug allergies.

The following vital signs are recorded/reported today:
Weight: 279 lbs.
Height: 6’1”
Blood Pressure: 148/88
Respiration: 17/minute
Pulse: 70 beats per minute

Medications:
Sodium warfarin
Bumetanide
Amlodipine
Sertraline HCL

Social History:
Mr. Snagle is actively engaged in his community and church. He works on an ongoing basis with the camp program for which he is a member of the board of directors and sits on the city zoning board. Mr. Snagle occasionally smokes a cigar and uses alcohol moderately. He drinks two liquor drinks per day on a regular basis. On occasion, he may have three drinks in social situations. Mr. Snagle is an independent person and has no functional limitation in his activities.

Dental History:
Mr. Snagle has a full complement of teeth and has an urgent problem today with the fracture of #30. He had his wisdom teeth extracted at age 23. He has several teeth with small restorations and one crown as a result of a fracture of a cusp. His periodontal health is good, with only one area of pocketing beyond three millimeters. A clinical examination reveals good oral hygiene, good periodontal health, and #30 that is fractured at the gingiva and through the furcation. Mr. Snagle reports brushing twice per day with fluoride toothpaste and occasionally uses mouthwash.

Current Dental Problem:
A periapical radiograph of tooth #30 reveals a fracture through the furcation area, and the tooth is determined to be nonrestorable.

Dental Chart:
Missing:
Teeth # 1, 16, 17, 32

Restorations:
Teeth # 14 = O Amalgam
18 = O Amalgam
19 = Crown
29 = O Amalgam

Decay/Fracture:
Teeth # 30 = Fracture through furcation

Graphic Chart:
Red lines over roots represent periodontal pocket depths.
Radiographs:
(Insert radiographs prior to using case)

Learning Issues:
1. What are the patient’s primary medical and dental problems?
2. In the event the patient requires an extraction, how will that be managed?
3. What other treatment options might be considered?
4. What steps are required to assure that the patient’s coagulation status is safe for extraction?
5. Explain the laboratory tests used to evaluate the effect of warfarin.
6. What is an INR, and how is it determined?
7. What definitive treatment options are available to this patient postextraction?
8. How will definitive treatment be managed in this patient?
9. What side effects might this patient be experiencing from his medications?
10. How does the patient’s new diagnosis of a small aneurysm impact your ability to provide dental treatment?
11. What is the patient’s risk of future dental disease based on his medication profile?
12. Prescribe a preventive regimen for this patient.

Learning Objectives:
The student will be able to:

1. Discuss the importance of assessment of the elderly dental patient as it relates to treatment planning, patient management, dental care provision, and maintenance of oral health.

2. Discuss the principles of oral disease management for elderly patients with varying degrees of functional capabilities and disease status.

3. Compare the patterns of dental care utilization across age, gender, racial and ethnic groups, and historically among older adult cohorts.

4. Describe ways that dental treatment is impacted by systemic disease.

5. Describe how to prescribe preventive agendas and devices indicated for a preventive dentistry maintenance plan for the elderly.
Case: John Stanek

Population:
This patient is an independent-living older adult.

Patient Photo:
(Insert photo prior to using case)

Description:
Mr. Stanek is a 67-year-old male who comes to the dental clinic at the school for care. He has been a patient of the school for several years and has seen many students graduate from the institution. He enjoys his visits to the school and knows many of the appointment staff on a first-name basis. Mr. Stanek has undergone multiple levels of care at the school and is loyal to the school for helping him keep his teeth and gums healthy. Mr. Stanek is in the middle of another round of treatment planning and comprehensive care. He comes in today for evaluation of his radiographs and the complete oral examination that occurred on his last visit. He is expecting today to hear what options he has for his treatment.

Patient Demographic Information:
Mr. Stanek is the married father of three grown children. By trade, he owns and operates a landscaping company that has been in business for 29 years. He is a graduate of a state university in agriculture. He spends long hours during the spring, summer, and fall months on his business. In the winter, his company offers snow plowing service for area residents and local businesses while working on design projects for the next season. His wife is a secretary at the local community college. Together, they have a comfortable income and lifestyle, with a combined annual income of $70,000. Mr. Stanek has secured a modest medical and dental insurance program for his family and the staff of his company.

Medical History:
Mr. Stanek has a history of Type I diabetes since the age of 13. He has the diagnosis of hypertension, which he believes is well controlled. He has been hospitalized twice for his diabetes, but that was many years ago. He has no known drug allergies. He is in remarkable health because of the constant physical exercise he gets while working in his business.

The following vital signs are recorded/reported today:
Weight: 240 lbs.
Height: 5’9”
Blood Pressure: 150/85
Respiration: 16/minute
Pulse: 65 beats per minute

Medications:
Humulin
Captopril
Amlodipine
Furosemide
Acetaminophen for minor aches and pains

**Social History:**
Mr. Stanek is a well-controlled Type I diabetic with a history of hypertension. He remains active in the workforce, owning and operating his own business. He is an active member of his church, where he is involved in teaching religious classes to third-graders. He and his wife anticipate their third grandchild later this year. Mr. Stanek is a nonsmoker but uses smokeless tobacco often when working. Mr. Stanek enjoys beer and consumes an average of six beers per week. He starts his day with two large cups of coffee.

**Dental History:**
Mr. Stanek has been a longstanding patient of the school and is in need of comprehensive care again. He has not been in for about one year and has some urgent needs for treatment. Although he is not in pain, he knows he has one tooth that has some serious problems and will need extensive work. He has a history of periodontal disease and treatment. Because of his treatment, he has multiple areas of cemental exposure to the oral cavity. He has recently come in for a new set of full mouth radiographs and is returning for his treatment planning session with his student.

**Current Dental Problem:**
Upon examination, Mr. Stanek is shown to have moderately poor oral hygiene with plaque accumulation in all four quadrants. He has heavy calculus formation on the lingual of the anterior mandibular teeth and buccal to the maxillary first molars. Because of the previous periodontal treatment, he has multiple areas of root exposure, several of which have developed root surface caries. Tooth #14 has a missing restoration, has re-decay, and has an apical abscess on the periapical radiograph. Mr. Stanek is complaining about having symptoms of dry mouth, which are troublesome for him during his workday and at night.

**Dental Chart:**
- **Missing:**
  - Teeth # 16, 17, 32
- **Restorations:**
  - Teeth # 3 = MOD Amalgam
  - 8 = B Composite
  - 11 = D Composite
  - 28 = B Amalgam
- **Decay:**
  - Teeth # 6 = B
  - 10 = B
  - 14 = B & MOD loss of restoration with re-decay
  - 15 = B
  - 24 = B, M, L
  - 25 = B, M, L
  - 29 = L

**Graphic Chart:**
Blue line represents gingival margin. Red lines on teeth roots represent pocket depths.
Radiographs:
(Insert radiographs prior to using case)

Learning Issues:
1. What are the patient’s primary medical and dental problems?
2. How will you judge the level of control in this diabetic patient if he needs a surgical procedure?
3. How do the medications that the patient is taking contribute to the development of oral disease?
4. What health and oral health risks does the patient have related to his occupation and to his diagnosed medical conditions?
5. What treatment will you recommend for this patient?
6. How will you treat his xerostomia?
7. What preventive strategies are important for disease prevention in at-risk patients?
8. If the patient needed an extraction of #14 and wanted a single tooth implant to replace the lost tooth, would you recommend that treatment? Why or why not?
9. How is healing impacted by his disease processes?
10. What is the risk of placing an implant in a patient such as this?
11. List the factors that contribute to the development of root caries.
12. What preventive strategies are important for prevention of root caries?
13. What products could you recommend and prescribe for prevention in this patient?
14. What are the most reliable restorations for persons with root surface caries and xerostomia?
15. What is the range of restorative options for the treatment of root surface caries?

**Learning Objectives:**
The student will be able to:

1. Discuss the importance of assessment of the elderly dental patient as it relates to treatment planning, patient management, dental care provision, and maintenance of oral health.

2. Apply patient and population demographics to an understanding of dental disease risk in various cohorts of aging Americans.

3. Counsel patients regarding modifiable risk factors for oral disease.

4. Describe the causes of xerostomia and its impact on oral health in aging.

5. Discuss the principles of oral disease management for elderly patients with varying degrees of functional capabilities and disease status.

6. Compare the patterns of dental care utilization across age, gender, racial and ethnic groups, and historically among older adult cohorts.

7. Describe ways that dental treatment is impacted by systemic disease.

8. Describe how to prescribe preventive agendas and devices indicated for a preventive dentistry maintenance plan for the elderly.
Case: Beatrice Sharp

Population:
This patient is an independent-living older woman living in a suburb of a major city.

Patient Photo:
(Insert photo prior to using case)

Description:
Ms. Beatrice Sharp is an attractive 82-year-old edentulous woman who presents to the dental office for denture whitening or a new set of dentures. Ms. Sharp is a patient of record in the office but has not had a dental visit for the past seven years. For many years, her husband, now deceased, visited the dental office every six months for routine examinations, cleanings, and an occasional restorative procedure.

As a result of severe periodontal disease, Ms. Sharp became edentulous in her early 60s. She has had the same set of dentures for the past 22 years, with one reline of the mandibular denture at age 75. Although she is content with the fit (retention and stability) of the maxillary denture, she recently noticed that the lower denture was a bit loose at times. More importantly to her, the teeth look yellow and dull, and this “makes her look old.” She occasionally uses denture adhesive and has tried to clean the denture with baking soda and toothpaste, but it has not worked as she hoped. She wants her teeth brightened so that they are bright and white, as this will make her look younger.

Ms. Sharp is a meticulous dresser and has maintained her appearance. She is concerned about not having much money, except for Social Security and a small retirement pension from her husband. She uses most of her money to maintain her home and car. She is in a rush to get her teeth “fixed,” because she is interested in being more social and thinks new teeth will improve her aged appearance.

Patient Demographic Information:
Prior to retirement, Ms. Sharp worked as a part-time salesperson in the retail clothing business, and her husband worked as a bus driver. They have two daughters and seven grandchildren. Three years ago, after a long illness, Mr. Sharp passed away. Prior to his death, Mrs. Sharp cared for her husband at home for four years. Most of her family lives nearby, and at least one family member visits every week.

Ms. Sharp drives a 20-year-old car that she keeps in good condition. As she ages, she drives less and less and generally stays in her neighborhood. She claims this is because of the price of gasoline; however, her family thinks that she is not comfortable driving. Recently, she sideswiped a car.

Ms. Sharp receives both Medicare and medical assistance benefits. She sees her physician every three to four months and attends a Coumadin clinic every month. She has her eyes examined once every two years and is due to have cataracts removed from both her eyes.

Medical History:
Ms. Sharp has the following:
1. Hypothyroidism, diagnosed 35 years ago.
2. Cardiac arrhythmia, diagnosed six months ago. She has her blood levels checked monthly and modifies her Coumadin dosage per the clinic’s recommendations.
3. Spontaneous fracture of left hip 18 months ago. She had surgery, was rehabilitated, and needs a walker for long distances but often forgets to take it with her.
4. Skin cancer (face and arms). She visits the dermatologist twice a year.
5. Cataracts (both eyes). She is due to have the cataracts removed in two months.

The following vital signs are recorded/reported today:
Weight: 117 lbs.
Height: 5’1”
Blood Pressure: 120/72
Respiration: 12/minute
Pulse: 65 beats per minute

Medications:
- Synthroid
- Coumadin
- Multivitamin (generic)
- Tylenol for occasional headaches, aches, and pains

Social History:
She lives alone in a ranch-style home, close to public transportation. She has maintained a driver’s license and insurance on a 20-year-old car. She is the proud owner of two cats. She is a nonsmoker and a nondrinker. To help save money, she grows vegetables in her garden for both immediate consumption and to can for use at a later date.

Recently, she has acknowledged that she is lonely and is thinking about attending the local senior center for some activities and lunch. She is self-conscious that her teeth are old and yellowed, and she thinks this makes her look older than she is. She would like to find a companion.

She is unsure whether Medicare or medical assistance provides dental benefits; however, if not, she will ask whether her family is willing to split the cost with her.

Dental History:
Ms. Sharp has not been to a dentist in seven years, as her dentures have not bothered her and she felt that she had no reason to go. She believes there is no need to see a dentist if you have no natural teeth and no pain. She felt lucky that her days at the dental office were over. She cleans her dentures every day, brushing with a toothbrush and soaking them for five to ten minutes in Polident.

She reports that the lower denture does not fit like it used to but that she is not particularly concerned, as she expected this to happen, given her age. When she is with others, she uses denture adhesive on the lower denture. She always sleeps with her dentures in her mouth. Once she tried to sleep without her teeth but was very restless and did not get a good night’s sleep. Her mandibular denture has two fractured teeth in posterior; however, she is not aware of this, and it does not cause her any discomfort.

Dental Chart:
Insert Patient Panorex: no significant findings

Missing:
Teeth # 1-32

Current Dental Concerns:
During her initial assessment, you learn that Ms. Sharp is rather impatient and is disturbed that you were 10 minutes late for her appointment. She wants bright white teeth and is hoping you can do something with what she has, quickly and inexpensively.

She needs information about routine oral examinations, cleaning, and maintenance of dentures, as well as the time needed to make new dentures. Finances are a concern, as there are no dental benefit programs available and she is a bit hesitant to ask her family for money.

Learning Issues:
1. Discuss the universal need for an oral examination every six months or one year.
2. Describe the eligibility criteria for medical assistance, the benefits in general, and the dental benefits for the elderly in your state.
3. Describe how the dental benefits of medical assistance vary by state.
4. Describe the eligibility criteria for Medicare, the benefits in general, and dental benefits specifically.
5. Discuss office protocol when the dentist is running late. Describe the role of each staff person.
6. Describe office protocols for working with demanding or difficult patients.
7. Discuss appointment scheduling options to meet demands of patients who may require additional time.
8. Describe age-related oral changes associated with denture wear and the need for routine examinations.
9. Describe recommended daily oral care protocols for complete denture wearers.
10. Describe the components of denture adhesives and indications for use.
11. Discuss concerns about Coumadin use in general. Are you concerned about this patient’s use of Coumadin?
12. Describe philosophy of care and options when a patient demands inappropriate services (e.g., “too white” teeth, immediate service).
13. Describe the impact of cataracts and their removal on one’s vision and quality of life.
14. Discuss the impact of good oral health on quality of life.

Learning Objectives:
The student will be able to:

1. Discuss the general health and dental benefits of Medicare and Medicaid.
2. Identify communication skills needed to manage difficult behaviors.
3. Discuss the education and role of the dental team to facilitate appropriate patient behavior.
4. Comprehend that age is a risk factor for oral cancer.
5. Have knowledge of key risk factors and protocol of an oral cancer examination.
6. Understand the risk and management of cardiac arrhythmias.
7. Describe daily oral care protocols for patients with complete dentures.
8. Discuss code of ethics and professional responsibility as they relate to patient demands.
9. Identify the impact of cataracts on vision and quality of life.
10. Discuss the impact of oral health on quality of life.
History and Background:
Mrs. K is an 80-year-old Caucasian female living with her 92-year-old husband in a large apartment complex on a fixed income. Her daughter, who accompanied Mrs. K to the dental office, stated, “My mother is not eating well and may have lost weight.” The daughter, Barbara, commented that since her last visit six months ago, her mother appears to have become more emaciated and thin. Neither the daughter nor the mother can identify a specific weight loss cause. Mrs. K may be agreeable to necessary dental treatment but is hesitant of extensive interventions.

Mrs. K is currently being treated for angina, which she said developed two to three years ago. She has hypertension, which was diagnosed 10 years ago, and has a current reading of 170/99. Two years previous, Mrs. K was hospitalized for chest pain, which the patient’s daughter believes was diagnosed as “heart disease.” Mrs. K occasionally experiences dyspnea on exertion, ankle edema, fatigue, and lethargy. She has been taking Atenolol 50 mg po qd for the angina, along with NTG 0.4 mg/24-hour patch. She says she wears one patch for a 48-hour period before changing to a new patch in order to make her supply last longer. She is also taking HCTZ 25 mg po qd for her hypertension and is on an aspirin EC 81 mg po qd. She tells you that she does have some nifedipine XL (90 mg po qd) around the house, which she started taking again about two months ago on her own, because she thought it might help the angina she was experiencing. She is also taking 0.25 mg a day of digoxin. She has diabetes mellitus, which is being controlled by diet, glipizide XL 10 mg po qd, and metformin 500 mg po bid. She has had arthritis for 20 years and is using ibuprofen (Motrin) 800 mg po tid for symptom relief.

In 1991, Mrs. K had a total hip replacement. She now walks with a walker. She is also taking sertraline 50 mg po qd for depression, which developed seven months ago after her 54-year-old daughter was killed in an automobile accident. She recently bought some St. John’s wort at the drug store, because a friend told her it was good for depression. She has cataracts and hearing loss. She now has three living children—one son and two daughters. She missed her last scheduled physician visit four months ago. She smoked one pack of cigarettes a day for 30 years and stopped 10 years ago. She drinks one to two ounces of alcohol a week. Her mother had diabetes, her father died of “cancer of the stomach,” and her son has “heart problems.”

During a medical history review, Mrs. K acknowledged having experienced chest pains or radiating pains, dyspnea on exertion, ankle edema, fatigue and lethargy, a history of bruising easily, joint and bone pain, depression and anxiety, and visual problems. She also stated that she has been having some discomfort in her mouth.

Mrs. K had notable small pinpricks on her fingertips, which she attributed to her hobby of quilting. She reported that she makes quilts for charity, including the children’s ward of the local hospital (a favorite since one of her twin sisters died there at age 12 of a brain tumor), and for her church volunteer work, where her family has held membership for four generations. She reports that she has hardly been able to quilt for the past four months because of her vision and joint pain. In addition, she has not been to church or even choir practice since her daughter died. When asked the reason, she said it’s too much trouble to get there.

Mrs. K’s extraoral examination revealed redness and crusting in the commissures of the lips, which bleed when she opens her mouth wide. No lymphadenopathy or skin lesions are visualized or palpated. Intraoral examination reveals that she is partially dentate with some teeth
remaining in both arches. Remaining teeth have many restorations and new carious lesions. Several teeth are present with root surfaces exposed to the apices. In addition, a majority of the mandibular teeth have severe periodontal attachment loss, with pocket depths ranging from five to eight millimeters. Furcation involvement is present in all quadrants. She does not wear any removable appliances. She has a white coating of the palatal mucosa that can be rubbed off, leaving an erythematous mucosa with pinpoint bleeding spots on the area covered by the denture. Her posterior mandibular alveolar ridge mucosa exhibits multiple areas of white patches that cannot be scraped off bilaterally with a piece of gauze. The floor of her mouth does not exhibit any lesions, but a decreased saliva pool is identified. Her buccal mucosa exhibits bilateral thin white lines in a net-like pattern without any ulceration. Her tongue has a smooth and dry appearance. On the lingual aspect of her mandible, there are bilateral bony protuberances covered by intact mucosa. Upon palpation of her mucosa, a decreased amount of lubrication was evident, and her tissues seemed “sticky.”


Case History Questions:
1. What are the main patient and family concerns and needs?
2. What are the medical, pharmacological, functional, and psychosocial issues that may influence dental diagnosis, treatment planning, dental care delivery, and prognosis?
3. How can the dentist utilize an interdisciplinary team for more accurate assessment, effective decision making, treatment provision, and maintenance of care?

4. What may be viable dental treatment approaches for Mrs. K?

5. What are the potential problems associated with the medical, psychosocial, and dental management of Mrs. K if extensive rehabilitative and invasive therapy is provided, and how should these factors be managed?
Case: Mrs. Miriam Brodsky

Mrs. Miriam Brodsky is a WDWN, active 77-year-old female who presents to your dental office, which is located in her winter place of residence, with a chief complaint of “I need a checkup.”

Description:
The patient’s last dental visit was three months ago at a private dental office in her home city (1,500 miles away), where she resides approximately five months out of the year. She received a dental prophylaxis and exam at that visit. Mrs. Brodsky reveals that although her niece is her dentist at home and does provide a “friends and family discount of 10%,” she would like to see whether she can receive treatment for a lower cost. Mrs. Brodsky is a private-pay patient and is willing to pay for quality dental care but states she has limited discretionary resources available. She also has more time available for continuous dental care in her winter residence. Mrs. Brodsky’s primary physicians reside in her home city, although she does maintain an internist at her winter residence for emergencies.

Medical History:
Illnesses: Cardiovascular disease, hypercholesterolemia, hypertension, cardiac arrhythmia, myocardial infarction 1998

Hospitalizations: 2001—Appendectomy
1998—CABG x 4

Medications: Coumadin: 5mg x four days and 2.5mg x three days
Pravachol 40mg: once a day (OD)
Atenolol 25mg: twice a day (BID)
Hydrochlorothiazide (HCTZ) 25mg: two tabs once a day (OD)
Premarin 0.625mg: once a day (OD)
Ca++ 500 mg: twice a day (BID)
Multi-vitamin: once a day (OD)
Protonix 40mg: once a day (OD)

Allergies: No known drug allergies (NKDA)

Social History: Denies tobacco products and recreational drugs and drinks socially on occasion.

Family History: Married three times; four children
Father deceased at age 95, unknown cause
Mother deceased at age 93; history of cardiac disease and hypercholesterolemia

Vital Signs: BP: 135/85  Pulse 72R    R: 14    T: 98.2 F

Clinical Exam:
Extraoral: No asymmetries, lesions, or growths noted; no lymphadenopathy; no TMD noted

Intraoral: Soft tissue: Generalized plaque; localized areas recession #6-10, #22-27; localized areas of gingivitis #22-27
Hard Tissue: Multiple missing teeth; long-span fixed PFM bridge work #2-14, #20-21, #28-31; distal composite #22; defective distal composite #23; lingual endo access composites #24, 25; distobuccal decay #31

Periodontal probing reveals pocket depths no greater than three millimeters.
Mobility: 3+ #24, 25

Radiographic examination reveals:
- Missing teeth #1, 15, 16, 17, 18, 19, 30, 32
- RCT #5, 6, 7, 8, 9, 10, 14, 24, 25, 28
- PAP #24, 25
- Generalized horizontal bone loss
- Severe bone loss (80%) #24, 25
- Moderate bone loss (50%) #6, 23

Radiographs:
Learning Issues:
1. Prior to the rendering of dental treatment, what medical issues must first be addressed?
2. What is the proper medical management for patients taking the regimen of prescription medications that Mrs. Brodsky has been prescribed?
3. Which, if any, laboratory evaluations may be required prior to treatment?
4. What, if any, medical issues are impacted by Mrs. Brodsky’s oral condition?
5. What concerns should a treating dentist have regarding Mrs. Brodsky’s living arrangements?
6. How might Mrs. Brodsky’s family history impact the dental treatment plans?
7. What recommendations for rational dental treatment might be presented to Mrs. Brodsky?
8. What pharmacotherapeutic drugs may be used or avoided in postoperative management?

Learning Objectives:
The student will be able to:

1. Reflect on the impact of living arrangements and geographic location on health care utilization.
2. Describe the living arrangement of the older adult population.
3. Understand the importance of proper medical history-taking in the older population.
4. Describe the physiology and presentation of age-related cardiovascular disease.
5. Describe the impact of peripheral and diminished blood flow, atherosclerosis, and plaque formation.
6. Describe the impact of concurrent medical conditions in the older adult.
7. Understand the pharmacology of the patient’s medication list as related to the provision of dental care.
8. Discuss adverse drug reactions, compliance behavior, and drug overutilization.
9. Discuss treatment planning and patient management in the context of social supports and coordination of multiple caregivers.
10. Discuss the relevance of the oral examination and past dental history to patient compliance and understanding.
Case: Mr. JG

Case Presentation:
Mr. JG, a 79-year-old white male, was referred to your practice by a colleague. Following completion of the health history, the dentist notes a history of two myocardial infarctions and knee replacement surgery.

Question 1: Should you premedicate this patient before invasive dental procedures?

Question 2: What else do you need to know before you make this decision?

Medical Consultation:
The dentist decides that it is important to consult with the cardiologist and the orthopedic surgeon. The cardiologist discusses the patient’s MVP with regurgitation. Upon consultation, the dentist is advised by both parties that he needs to premedicate. The orthopedist suggests Keflex (500mg x four, one hour before treatment).

Question 3: What is the AHA recommendation for prophylaxis? Is it in line with the orthopedist’s recommendation?

Prescription Decision:
The AHA recommends amoxicillin or Keflex. The cardiologist deferred to the orthopedist, and Keflex was used.

Question 4: What is the relative confidence that you have in using Keflex over amoxicillin?

Question 5: What is the legal exposure for the dentist? The cardiologist? The orthopedist?

Learning Objectives:
The student will be able to:

Cardiopulmonary Issues
1. Discuss the need for antibiotic prophylaxis.
2. Describe myocardial infarction and angina.
3. Discuss disease progression and multisystem effects.
5. Discuss use of dental medications during invasive treatment and their potential adverse effects.

Medication Use, Compliance, and Pharmacological Issues
1. Describe the use of medications (prescribed and over the counter) in older adults.

Provider-Provider Communication Issues
1. Describe interdisciplinary collaboration, referral, and consultation.
Case: Mrs. SW

Patient Presentation:
Mrs. SW, a 68-year-old white female, has been a patient of record for 11 years and presents for a routine six-month hygiene visit. Following routine update of the patient medical history, where nothing new was reported, an extraoral and intraoral examination was completed. The hygienist noticed that the clinical appearance of her gingiva had changed significantly. Her tissue was red and inflamed and had isolated areas of hyperplasia, particularly in the molar regions. Pocket probing depths in these areas were in the four- to six-millimeter range.

Question 1: What could account for the significant changes to the oral soft tissues?

Question 2: What followup questions should be asked concerning her medical history?

Followup:
After documenting the findings, the dentist is consulted, and further information was gathered concerning the medical history. Mrs. SW remembered that her physician had changed her hypertension medication to Felodipine from Norvasc.

Question 3: What is the mechanism of action for the two medications?

Question 4: Is Felodipine use connected to gingival change?

Intervention:
After researching the connection between Felodipine, the dentist reports the finding to Mrs. SW's physician and asks whether switching Mrs. SW to another hypertension medication is possible. Following a cleaning, the patient is rescheduled for a one-month followup.

Question 5: What would you do if the condition does not resolve?

Learning Objectives:
The student will be able to:

Cardiovascular Issues
1. Describe the presentation of hypertension in older adults.
2. Discuss antihypertensive agents and their side effects.

Medication Use, Compliance, and Pharmacological Issues
1. Describe the use of medications (prescribed and over the counter) in older adults.
2. Discuss compliance behavior and the ability to understand instructions.
Case: Mrs. M.

Initial Presentation:
During a routine dental visit, Mrs. M., a 72-year-old housewife, begins to complain of chest pain. Mrs. M. states that approximately four hours ago, while taking her morning walk, she began having chest pain but thought it was indigestion and it subsided. She describes the pain as a dull, substernal ache that radiates into her left arm and jaw. She tells the dentist that the pain is moderately severe and seems to be getting worse. The pain is not affected by movement or deep inspiration, but it is relieved slightly when she rests. She has also noted slight shortness of breath and sweating.

Question 1: What procedure should the dentist follow next?

Question 2: Does the radiation of the substernal pain to the left arm and jaw help to narrow the diagnostic possibilities?

Question 3: What is the importance of the pain being unaffected by movement or deep inspiration?

Medical History:
Her medical history is significant for 20 years of high cholesterol, for which she is treated with the hydroxymethylglutaryl-coenzyme A (HMG-CoA) reductase inhibitor lovastatin, and 35 years of high blood pressure, for which she takes the calcium channel blocker diltiazem. Mrs. M. has a 65 pack per year history of smoking. She drinks no alcohol and takes no other drugs or medications. She is postmenopausal but does not take hormone replacements because her mother died of breast cancer at the age of 55. She has no family history of heart disease of which she is aware. Mrs. M. is happily married to Mr. M., who is a retired electrical engineer.

Question 4: What does the medical history reveal about the patient’s presentation?

Question 5: What conditions are in the differential diagnosis?

Discussion of Parts 1 and 2:
As with other complaints, chest pain may indicate a variety of diagnoses. The quality and nature of the pain, risk factors, and associated symptoms can be very helpful. Although many disorders may cause chest pain, the upper trunk of the body is relatively devoid of organs. Therefore, approaching a patient’s problem from an organ system basis is often helpful and may quickly eliminate those etiologies that are immediately life-threatening. With some exceptions, pathology in the following structures can result in chest pain: the pericardium, myocardium, lungs, aorta, chest wall, and esophagus. Characteristics of the pain can rule out many etiologies initially. In this particular case, dull, aching pain not affected by movement or inspiration is indicative of organ parenchymal involvement, making pleural or pericardial involvement less likely. In addition, the patient’s history of smoking, lack of hormone replacement, high cholesterol, and high blood pressure, as well as the radiating nature of the pain, make a primary cardiac problem highly likely. Esophageal problems often present similarly; however, esophageal disorders are usually not acutely life-threatening. Any presentation such as this requires the physician to rule out a cardiac problem before pursuing other pathologies.

Physical Examination:
The dentist activates emergency protocols and calls 911. While waiting for EMS, the dentist monitors the patient and prepares information for the emergency technicians. Mrs. M.’s vital signs are as follows: temperature, 100°F; blood pressure, 152/90 mm Hg; pulse, 88 beats per minute, regular; height, 5'2″; and weight, 134 lbs. General appearance reveals a well-developed elderly woman who appears anxious and in some acute distress. Cardiac examination shows a regular rate without any murmurs, gallops, or rubs. The lungs are clear to percussion and auscultation. The remainder of the physical examination is within normal limits.

Question 6: Would the essentially normal physical examination deter you from pursuing a cardiac etiology?

Discussion of Part 3:
Except for a third (S3) and fourth (S4) heart sound and diaphoresis, the physical examination may reveal little in a patient with an acute cardiac event. A chest radiograph may help reveal a chest abnormality, and it is usually indicated when chest pathology is suspected. The normal result provides little information in this case, except that the patient does not have a pulmonary infiltrate, pleural effusion, or a collapsed lung.

Laboratory Tests:
The patient is transferred to the local emergency room by EMS. The dentist continues to monitor the progress of the patient. The patient’s electrocardiogram (ECG) shows anterior ST-segment elevation, but her chest radiograph is normal. Creatine kinase (CK) is 122 U/L and negative for myocardial damage. Lactate dehydrogenase (LDH) is 155 U/L and negative for myocardial damage. Aspartate aminotransferase (AST) is 12 U/L and negative for myocardial damage. Troponin I is 0.65 ng/mL and negative for acute myocardial infarction (MI).

Question 7: How would you interpret these laboratory results?

Discussion of Part 4:
Enzyme levels can be extremely helpful in the diagnosis of cardiac ischemia. However, as with any test, sensitivity and specificity are an issue.

CK is an enzyme found in skeletal muscle, cardiac muscle, and, to a much smaller extent, the brain. If this were elevated, the CK level would need to be fractionated into its isoenzymes to determine its origin. CK-MM is the most prominent isoenzyme; normal CK levels are virtually all CK-MM. This isoenzyme is found primarily in skeletal muscle. Cardiac muscle, on the other hand, is composed of both CK-MM and CK-MB. CK-BB is derived mainly from brain, gastrointestinal, and genitourinary tissue. Elevation of the CK-MB isoenzyme is indicative of cardiac injury.

Similarly, LDH is found throughout the body, and fractionation is necessary to determine its origin. LDH1 and LDH2 are elevated after an MI. AST is found in a variety of tissues. Although it is not fractionated, elevation of AST in conjunction with clinical evidence can help rule in cardiac ischemia. The troponins are found in both skeletal and cardiac muscle. However, monoclonal antibodies to the troponin in cardiac muscle do not cross-react with the troponin in skeletal muscle. The troponin tests are relatively new; their effectiveness for ruling an MI in or out is presently being evaluated, but they appear to be more sensitive and specific than the other enzyme tests. In addition, elevated levels of troponin I may be better indicators of mortality following unstable angina or MI.
Unfortunately, none of these enzymes can be expected to be elevated in the first few hours following an MI. Therefore, negative results do not rule out a cardiac event. The ECG tracing exhibiting anterior ST-segment elevation is consistent with an MI and should be followed up.

**Myoglobin:**
Fortunately, an astute physician ordered a myoglobin level on this patient, and the result was elevated.

**Question 8:** How does this information influence the determination of a diagnosis?

**Discussion of Part 5:**
Myoglobin is found in all muscle tissue, including heart muscle. Injury to any muscle from sources as disparate as blunt trauma and chemical or metabolic disorders may release myoglobin into the bloodstream. Although it is nonspecific, an elevated serum myoglobin level is probably the best indicator of an MI within the first six hours of the onset of chest pain. This is especially true if there is no evidence to suggest a metabolic or physical insult prior to measuring the level. In this case, the myoglobin elevation in combination with this patient’s history and ECG findings strongly suggests an acute MI as a diagnosis. It should be noted that this patient’s chest pain initially occurred during her morning walk. Heart attacks frequently occur in the morning and during exercise. Platelets clump more readily in the morning, and exercise increases the demand for blood to the cardiac muscle.

**Assessment:**
This patient has most likely suffered an acute myocardial infarction. The plan is to admit her to the cardiac care unit of the hospital and to arrange for a consult by a cardiologist.

**Question 9:** What treatment options are available for this patient?

**Question 10:** How should this event be recorded in the dental chart?

**Question 11:** How should routine dental care be altered in the future?

**Final Discussion:**
The approach to the patient with an acute MI is complicated and controversial. Many physicians currently disagree about the best form of treatment. Options include thrombolytic therapy with agents such as streptokinase or cardiac catheterization with balloon angioplasty. After coronary angioplasty, stents can be inserted to diminish the chances of recurring stenosis. Different approaches to the coronary patient depend on the physician, the patient, and the individual circumstances. However, close observation is always necessary following ischemic events, because patients are prone to arrhythmias that are potentially life-threatening.
Case: Mr. J.

Initial Presentation:
Mr. J., a 70-year-old plumber having a routine cleaning, sits up and complains of feeling “dizzy.” Upon further questioning, the patient states that “it feels like the room is spinning around.” The episodes have occurred three times in the past week. They usually begin fairly suddenly when he changes position, such as when he bends down to tie his shoe or pick up pipes at work. He has never actually fallen down, but he feels like he could easily do so. Mr. J. states that when the episodes occur, he sits down for a few minutes and then feels fine. He thought that these “attacks” would just go away.

The patient denies any other associated symptoms, such as tinnitus, hearing loss, headaches, paresthesias, ataxia, episodes of lack of coordination, visual disturbances, speech difficulties, and changes of consciousness. The patient’s medical history is largely unremarkable. Mr. J. denies any previous psychiatric disorders, as well as any symptoms of anxiety or depression. He suffers from no chronic illnesses and takes no medications on a regular basis.

Question 1: What information is needed to determine what this patient means by “dizzy”?

Question 2: How is balance normally controlled?

Question 3: Why is a medication history particularly important in this case?

Question 4: What is in the differential diagnosis?

Discussion:
The associated signs and symptoms are a key in differentiating central dizziness from a vestibular disorder. Patients may describe a variety of different symptoms as “dizzy” spells. Unfortunately, the word “dizzy” is fairly nondescript; therefore, it is important to differentiate whether a patient is referring to orthostatic lightheadedness or vertigo.

Balance is controlled via input to the central nervous system (CNS) from several systems. The systems are slightly redundant so that the loss of one would not prohibit an individual from standing or walking. However, malfunction of any one of these systems or of the connections between them can cause dizziness.

The visual system uses light stimuli to relay data about head position relative to the horizontal. The proprioceptive system uses pressure stimuli from the peripheral nerves to relay data about the position and movement of the limbs. The peripheral vestibular system consists of the semicircular canals, the saccule, and the utricle in the inner ear. Cells in each of these structures have stereocilia stretching into the gelatinous perilymphatic fluid of the inner ear. Movement of the stereocilia results in signals to the CNS via the eighth cranial nerve (CN VIII). The semicircular canals provide information about angular movement of the head, whereas the utricle and saccule provide information about acceleration of the head and its relationship to gravity. Specifically, CN VIII relays this information to the vestibular nuclei in the brain stem. The vestibulo-ocular system also controls positioning of the eyes during head movement. (For example, you should be able to move your head from side to side while continuing to view this page.)
Disturbances of the vestibulo-ocular system can result in abnormal movements of the eyes, known as nystagmus. The medulla, pons, and midline cerebellar structures coordinate and integrate information from each of these systems. Once a patient is determined to be suffering from vertigo, possible dysfunctions of any one of these structures or systems must be considered. There are many medications that can cause dizziness by affecting primarily the vestibular system or the CNS. For example, aminoglycoside antibiotics (e.g., gentamicin) often affect the vestibular system. A variety of sedatives and antidepressants also are known to result in dizziness via their effects on the CNS. A medication history including prescriptions, over the counter drugs, and herbal remedies is always an important aspect of a medical history.

**Physical Examination:**
Mr. J. appears to be a healthy, well-developed man in no apparent distress. His vital signs are: temperature, 98.2°F; pulse, 76 beats per minute; and blood pressure, 122/76 mm Hg. His extraocular movements (EOMs) are intact. Neurologically, Mr. J. is oriented to person, place, and time. His strength and sensation are normal in all extremities. CN II-XII are intact. Proprioception is normal, and cerebellar functions are intact. Romberg's test is normal; however, the head positioning maneuvers resulted in vertigo and nystagmus, which resolved within one minute.

**Question 5:** Do the symptoms and signs point toward a CNS problem or a peripheral problem?

**Discussion:**
In any patient with true vertigo, a complete history and physical examination focusing on neurologic diseases are very important. A variety of potentially serious CNS pathologies such as tumors or vascular accidents must be ruled out initially. In this case, the absence of such factors makes a peripheral disorder (e.g., inner ear or position sense) much more likely. However, there are few signs that might indicate an inner ear disturbance or other sensory pathologies.

One potentially important aspect of Mr. J.'s symptoms is that they occur with sudden changes in position. This fact is confirmed by the positive head positioning maneuver, which indicates a vestibular dysfunction dependent on position. Various maneuvers are performed to diagnose vestibular dysfunction, but most involve head movement with one ear down and then with the other ear down. If the vertigo is reproduced, then the diagnosis of vestibular dysfunction is likely, and the problem is in the ear that was down when the symptoms occurred.

The most common cause of a peripheral disorder is benign positional vertigo (BPV), which is sometimes referred to as benign paroxysmal positional vertigo. BPV is the most common cause of vertigo. Fortunately, as the name implies, it is a relatively harmless disorder. However, as previously mentioned, it is extremely important to rule out other more dangerous etiologies before arriving at the diagnosis of BPV. Although the definitive cause of BPV remains somewhat of a mystery, the disorder is most likely caused by mineral deposits within the semicircular canals, which bend the hair cells in an abnormal fashion.

**Question 6:** How should the dentist refer the patient to a physician?

**Question 7:** What should the physician tell Mr. J. about his problem?

**Question 8:** How might the physician afford Mr. J. some relief?

**Discussion:**
Mr. J. is diagnosed with BPV. In some cases, BPV resolves spontaneously. If not, there are a variety of exercises, known as particle repositioning, which have proven successful in dislodging the deposits in the semicircular canals. Mr. J.’s treatment plan includes being scheduled for an instructional session to learn particle repositioning exercises. In other patients, pharmacologic and surgical intervention may be necessary. In any event, Mr. J. should be cautioned that the vertigo may strike without warning and that he should avoid situations where loss of balance might result in serious injury. Holding on to something or sitting down on the floor or ground until the episode resolves is prudent advice.
Case: 64-Year-Old Woman

Initial Presentation:
A 64-year-old woman complains of feeling “dizzy” during a routine restoration. With specific questioning, she describes episodes of being very lightheaded, like she is going to “pass out.” She has never actually lost consciousness. Episodes occur when she moves from a sitting to a standing position or when she sits up quickly in bed. She has a history of chronic, poorly controlled hypertension despite treatment with a variety of antihypertensive medications. She was recently placed on prazosin for blood pressure control, and the lightheadedness began after this medication was initiated.

Question 1: What is the leading hypothesis at this point?

Discussion:
This individual is having episodes of lightheadedness, not vertigo. The feeling of lightheadedness often is an indication that the brain is not being well perfused. A variety of disorders can result in poor cerebral perfusion, but the history often gives clues about the pathology. A transient ischemic attack (TIA), for example, causes decreased perfusion because microthromboemboli from peripheral sites such as the external carotid artery block cerebral blood vessels. These episodes are transient because the microthromboemboli are quickly broken up by thrombolytic factors.

However, in this case, the positional nature of the disorder may be a major clue. Besides occlusion of an artery, relative hypovolemia also can result in lightheadedness. There is no evidence of significant dehydration or blood loss in this patient, which means that the volume of blood may be normal but that it is not redistributed properly with sudden changes in position. In this particular patient, antihypertensive medication should be considered as a very likely cause of her “dizzy” spells, because initiation of the drug is temporally related to the onset of the problem, and the medicine is known to work by dilating arterioles.

Question 2: How is blood pressure normally regulated when moving from a supine to a standing position?

Discussion:
The blood vessels of the body essentially form a closed-loop circuit from the heart to the periphery and back to the heart again. As a result, blood leaving one area must be replaced by blood from another. However, blood vessels are distensible tubes that can be stretched and collapsed. When an individual stands up from a sitting position or sits up from a recumbent position, the vessels in the lower extremities expand because of the static weight of the blood above those vessels. These expanded veins (and to a lesser extent arteries) have a larger volume capacity and therefore can hold more blood.

Because the vascular system is a closed loop, the larger volume of blood in the lower extremities, below the heart, results in (and is a result of) relatively less blood above the heart. The vessels that are located higher than the level of the heart tend to collapse because of the relatively lower pressure within the lumen of these vessels. For obvious reasons, however, the brain must remain fully perfused. Therefore, in normally functioning individuals, baroreceptors in the carotid arteries and aortic arch sense this drop in intraluminal pressure. The baroreceptors are merely stretch receptors. As the volume of blood in the aorta and the carotid arteries
decreases, the walls of these vessels become less distended. This stimulus, in turn, causes a
decrease in vagal tone and an increase in sympathetic tone throughout the body. As a result,
the heart rate increases, shifting more blood from the venous to the arterial system, and
peripheral vessels constrict. This increases total peripheral resistance and shunts blood to the
brain.

**Physical Examination:**
The dentist monitors the patient. Her orthostatic vitals are: supine blood pressure, 148/96 mm
Hg, and pulse, 82 beats per minute; standing blood pressure, 112/74 mm Hg, and pulse, 86
beats per minute, with a subjective feeling of lightheadedness after 20 seconds.

Question 3: How do these vital signs change your thinking about possible pathophysiologic
mechanisms leading to this person’s symptoms?

**Discussion:**
In this case, the heart rate increased by only four beats per minute after standing up. In a
person without cardiovascular problems, an increase in heart rate as small as this would not be
a concern. Normally, the increase in peripheral vascular resistance is enough to keep the brain
adequately perfused with only minor increases in heart rate. However, the dramatic decrease in
blood pressure after standing up and the subjective symptoms in this patient clearly indicate that
the brain is not being well perfused. In this patient, the heart should have increased by more
than four beats per minute but did not, which indicates a problem with the ability to increase
heart rate. A variety of factors, such as the use of β-blockers, cardiomyopathy, and autonomic
neuropathy, can interfere with an appropriate increase in heart rate.

Question 4: What is the procedure for referral?

**Final Discussion:**
This patient has orthostatic hypotension without an appropriate increase in heart rate. If she is
taking a β-blocker, her medication should be changed. If medication is not the problem, she
should be referred to a cardiologist for definitive evaluation. Complaints of dizzy spells are
common and may be quite puzzling. The etiology is usually benign and self-limiting but may be
serious. The approach to the symptom of dizziness begins with a careful history and then a
review of basic physiology. Is the patient having a primary balance problem or a significant
decrease in blood perfusion of the brain? If the patient states that rolling over in bed causes a
“spinning” sensation, there is certainly a problem with the inner ear. The patient has done
nothing to effect an orthostatic change. If, on the other hand, the patient feels like passing out
and the room starts to go dark after sitting up or standing, then there is probably a blood volume
problem or at least a relative volume deficit relating to an inability to shunt blood up to the brain
when necessary.

But determining the cause is not always so easy. Sometimes a perfusion problem may affect
the inner ear or the CNS and result in a balance abnormality. Sometimes, despite intensive
questioning, the patient cannot decide whether the symptom is best described as imbalance or
lightheadedness. Of course, the patient can undergo tests to try to recreate the symptoms and
better delineate the problem. Many ear, nose, and throat specialists have tilt chairs with which to
perform such testing. As with all approaches to clinical dilemmas, it is important to establish a
priority for all the possibilities. If it seems clear that the patient has BPV, there is time to treat the
symptoms and to see whether the problem resolves, warning the person of the dangers of
falling and advising methods to avoid injury. If it seems likely that the patient has a perfusion
deficit related to palpitations or some evidence of emboli, confirming the diagnosis and initiating treatment must be done quickly.
Innovative Models in Geriatric Dental Education

Innovative models are examples of excellence—the most innovative strategies, approaches, programs, processes, and systems that institutions use to educate predoctoral students in the area of geriatric dentistry. Each model includes contact information should you wish to explore the practice further.

On behalf of ADEA, the Advisory Committee thanks each dental school and the authors who contributed to this collection of innovative models in geriatric dental education. We hope that Innovative Models in Geriatric Dental Education, as a component of the Curriculum Resource Guide, will promote networking, collaboration, and innovation in dental education.

Contents

1. Marquette University School of Dentistry
   Comprehensive Interdisciplinary Geriatric Dentistry Curriculum

2. Marquette University School of Dentistry
   Interdisciplinary Geriatric Oral Health Website

3. University of Colorado School of Dentistry
   An Interdisciplinary Model for Community-Based Geriatric Dental Education: The Colorado Total Longterm Care Dental Program

4. The University of Iowa College of Dentistry
   Geriatric and Special Needs Program (Geriatric Mobile Unit and Special Care Clinic)

5. University of Pittsburgh School of Dental Medicine
   Certificate in Geriatric Dentistry
Marquette University School of Dentistry

Comprehensive Interdisciplinary Geriatric Dentistry Curriculum

The rapidly growing older population with complex dental, medical, and psychosocial needs requires competent dental clinicians with a unique set of attitudes, knowledge, and skills. Future general dentists must be able to work as interdisciplinary team members to provide optimal care to the aging population. As part of a schoolwide curricular revision and renewal, this four-year integrated geriatric dentistry curriculum was developed and implemented during the 2003-2004 academic year (initiated for the D1 class with subsequent years of the program implemented as that class cohort progressed through the four-year educational program). Geriatric concepts were woven into existing didactic material, rather than creating separate discipline-based courses. The key features of the curriculum employ a general dentistry approach, provide clinical experiences with older adults during all four years of instruction, facilitate progressive reinforcement of basic and behavioral sciences, and emphasize principles of preventive dentistry, public health, and ethics. The curriculum uses different teaching methods, including dental rounds, computer-assisted independent learning, small group discussions, and case-based instruction, to emphasize problem-solving skills, critical thinking, and lifelong learning. The curriculum emphasizes early clinical and community-based training, exposing students to the role of the dentist as a member of an interdisciplinary team caring for older adults.

D1 YEAR

DIDACTIC:
- Geriatric content in existing curriculum tracks—Foundations of Oral Health
  - Demographics
  - Introduction to gerontology
  - Physiology of aging
  - Age changes in the oral cavity
  - Nutrition
  - Effective communication
- Introduction to Clinical Practice
  - Preventive strategies for older adults—Oral Medicine and Diagnosis I
  - Attitudes of health care providers toward older adults
  - Common oral diseases in the elderly
  - Dementia

ROUNDS:
- Simple cases discussed seminar-style
  Concepts:
  - Ageism
  - Components of patient assessment
  - Psychosocial aspects
  - Ethical issues
  - Preventive strategies

CLINICAL COMPONENT:
- Introduction to Clinical Practice
Rotations to extramural sites (observation of interdisciplinary care)

ASSESSMENT:
- Student
  - Pre- and post-testing (modified Palmore’s Facts on Aging Quiz)
  - Written examination
- Program
  - Student focus-group feedback
  - Written course evaluations

D2 YEAR

DIDACTIC:
- Geriatric content in existing curriculum tracks—Biomedical Systems
  - Physiology of aging
  - Sensory changes during aging
  - Immune system changes during aging
- Oral Medicine and Diagnosis 2
  - Chronic systemic conditions in the elderly
  - Common oral concerns of the elderly—Oral Medicine and Diagnosis 3
  - Mucosal changes during aging
  - Diagnosis and risk assessment in older adults
  - Principles of treatment planning for older adults

ROUNDS:
- Simple and intermediate cases discussed seminar-style
  Concepts:
  - Ideal treatment vs. patient-perceived needs
  - Components of comprehensive assessment
  - Preventive Dentistry for Older Adults (CD-ROM)

CLINICAL COMPONENT:
- Intermediate Clinical Practice (Dent 481/482)
  - Preventive and maintenance care provided in the main clinic
  - Interdisciplinary practicum at extramural sites

COMMUNITY OUTREACH:
- Interdisciplinary rotations emphasizing education, prevention, and team management of the elderly at various levels of health in various settings

ASSESSMENT:
- Student
  - Clinical evaluations of patient treatment
  - Written and case-based assessments
- Program
  - Student focus-group feedback
  - Written course evaluations

D3 YEAR
DIDACTIC:
- Geriatric content in existing curriculum tracks
  - Pharmacological aspects and concerns
  - Public policy
- Access and treatment in alternative settings
  - Mobile units
  - Extended care facilities
- Hospital dentistry
- Ethical issues

ROUNDS:
- Moderate and complex cases discussed seminar-style
  Concepts:
  - Dentists as part of the interdisciplinary team
  - Caregiving, caregivers, and related issues
  - Making the dental office compatible with older adults

CLINICAL COMPONENT:
- Marquette University School of Dentistry (MUSoD) main and satellite clinics
- MUSoD rotation in Advanced Care Clinic
- Interdisciplinary practicum at extramural sites

COMMUNITY OUTREACH:
- Interdisciplinary rotations emphasizing education, prevention, and team management of the elderly at various levels of health in various settings

ASSESSMENT:
- Student
  - Clinical evaluations of patient treatment
  - Written and case-based assessments
- Program
  - Student focus group feedback
  - Written course evaluations

D4 YEAR

DIDACTIC:
- Participation in Senior Colloquium
- Independent learning
  - Virtual Aging Patient CD-ROM
  - Interdisciplinary geriatric oral health website

ROUNDS:
- Moderate and complex cases discussed seminar-style
  Concepts:
  - Advanced techniques, modified treatment procedures
  - Limits of care, methods to improve prognosis
  - Treatment in nontraditional settings

CLINICAL COMPONENT:
- MUSoD main and satellite clinics
- MUSoD rotation in Advanced Care Clinic
- Interdisciplinary practicum at extramural sites

COMMUNITY OUTREACH:
- Interdisciplinary rotations emphasizing education, prevention, and team management of the elderly at various levels of health in various settings

ASSESSMENT:
- **Student**
  - Clinical evaluations on patient treatment
  - Written reflection from Senior Colloquium
- **Program**
  - Student focus group feedback
  - Written course evaluations

Outcomes

A comprehensive evaluation strategy was developed to support ongoing refinements and modifications of the educational program. Surveys, focus groups, and clinical skills assessments conducted for the existing dental classes during the 2002-2003 academic year provided an initial baseline for comparison. The results revealed a general lack of knowledge and many misconceptions about the elderly. Additionally, students felt unprepared to manage older patients in the clinical setting. Followup surveys, focus groups, and clinical skills assessments have demonstrated a significant improvement in attitudes about aging and treating older patients and confidence in clinical management of the elderly with the new curriculum.

Contact

Jadwiga Hjertstedt, D.D.S., M.S.
Assistant Professor Clinical Services
Marquette University School of Dentistry
1801 West Wisconsin Avenue
Milwaukee, WI 53233
Phone: 414-288-6036
Fax: 414-288-3586
Email: jadwiga.hjertstedt@marquette.edu
Marquette University School of Dentistry

Interdisciplinary Geriatric Oral Health Website

This website was developed to provide an electronic learning environment for practicing health professionals and health professions students nationwide. It has been used in undergraduate and graduate teaching programs, as well as for continuing education purposes. The website represents a unique partnership between the Marquette University School of Dentistry and the Wisconsin Geriatric Education Center (WGEC, a consortium of universities, health professions schools, health care systems, and community organizations nationally recognized for its excellence in interdisciplinary health professions education and training). Major educational objectives emphasize education, public policy, and primary care, including:

- Providing interdisciplinary geriatric oral health education to health professions faculty, residents and students; health care professionals and paraprofessionals; caregivers; and community stakeholders providing services to the elderly.
- Promoting awareness of the importance of geriatric oral health to community leaders from business, government, academia, and health care involved in public policy and advocacy for senior citizens.

Website organization and development was initiated in September 2002 using a comprehensive planning process, including various needs assessments for geriatric oral health education, selection of content experts and topics, design of educational components, and identification of potential sponsors or funding sources. In January 2003, a grant proposal was submitted to the U.S. Department of Health and Human Services Health Resources and Services Administration Bureau of Health Professions (DHHS HRSA-BHPr) for website support ($100,000). By the end of July 2003, commitments for contributions and donations ($15,000) were obtained from program partners and several corporate sponsors to support other educational components. In September 2003, grant funding through DHHS HRSA-BHPr was officially approved, and the website received an endorsement from Special Care Dentistry.

The educational program consists of archived presentations, case studies, and state-of-the-art content summaries provided by national and international experts from various health professions. The content emphasizes multidisciplinary and interdisciplinary approaches and includes a comprehensive array of topics that provide the latest information on dental disease in the elderly, clinical dental management of older patients, case-based examples of comprehensive management of geriatric patients by dentists and other health professionals, and development of successful business plans that incorporate services to the elderly in a variety of treatment settings. The website contains all the features one would find at a major international meeting. It became operational on a 24/7 basis in April 2004 and can be accessed at www.wgec.org. A preview link can be used to learn more about the educational program. The site provides flexibility and an extended online learning environment for students, residents, and the busy professional. The homepage was designed to resemble a traditional live conference environment and contains the following major features:

- “Information desk,” containing a website map, guides for location of specific information, and a calendar of dates and times when content experts will host synchronous (“live”) case discussions, question-and-answer sessions, or interdisciplinary rounds.
- “Help desk” to assist with any computer hardware or software problems, ensuring that participants can make full use of the website and its features.
- “Evaluation center” where participants provide feedback regarding usability of the site, quality of the educational content, and suggestions for improvements.
• “Conference materials” rooms that are essentially breakout rooms where participants have access to biographies and contact information for content experts, background literature and references, state-of-the-art summaries, case studies, facilitated discussions, and assessment exercises for award of continuing education units for each of the topic areas.
• “Cybercafé,” where participants can communicate with each other in both synchronous and asynchronous modes (real-time chat rooms and threaded discussion boards).
• “Archived conference presentations” consisting of full audio and video streaming and viewing of various presentations (new presentations are added to the archived library each year).
• “Virtual exhibit hall,” where programs and resources related to geriatric oral health are advertised and sponsors have Web links to their homepages or short infomercials about their products and services.
• “Faculty development center,” where electronic learning modules are available for clinicians wishing to learn more about education or improving their teaching skills in the areas of adult learning theory, skills to enhance clinical learning, effective leadership of small group case-based seminars and rounds, utilization of technology in teaching, curriculum development, evaluation, and student assessment.

Currently, educational topics include geriatrics and gerontology, physiology of aging, epidemiology of geriatric oral health, access to geriatric dental care, geriatric oral medicine, geriatric pharmacology, caries and periodontal disease in the elderly, geriatric prosthodontics, nutrition and general health in the elderly, nutrition and oral health in the elderly, nursing and geriatric oral care, interdisciplinary treatment planning for the elderly, interdisciplinary dental care for medically compromised patients or patients with dementia, reimbursement for geriatric dental services, and building a geriatric dental practice.

In summary, this website provides educational components covering the state of the art in many areas of geriatric oral health. Cutting-edge distance education technologies provide continuous “on-demand” materials and access to content experts. Thus, the website represents a unique learning environment for all health care professionals, paraprofessionals, caregivers, and community stakeholders providing geriatric services. The website has been institutionalized and is self-sustaining. The initial DHHS HRSA grant was used to develop the technology infrastructure to support the website and conference archive. This upfront cost is now eliminated, making the program cost-to-service ratio much more favorable, and GlaxoSmithKline has generously provided $10,000 in financial support to maintain and update the website this year. Continuous updating and revision of the website are based on new material availability and user feedback. Future plans for the website include increasing the number of topic areas and amount of content, securing additional academic partners to provide new materials and content, and more aggressive advertisement and promotion of the website.

Outcomes

The educational components of this program target a wide variety of constituencies, including health professions faculty, residents, and students; health care professionals and paraprofessionals; caregivers; and community stakeholders providing services to the elderly, as well as community leaders from business, government, academia, and health care involved in public policy and advocacy for senior citizens. During the past two years, the program has achieved the following specific outcomes:
• 5,119 individuals have accessed the website for educational activities (61% dental, 39% other disciplines).
• Program evaluation has indicated a very high rating of satisfaction (91% favorable or very favorable).
• Three dental schools, two graduate programs, and two interdisciplinary training programs have used the website in some way as part of the regular geriatric curriculum for courses, workshops, and seminars.

Contact

Anthony M. Iacopino, D.M.D., Ph.D.
Professor, General Dental Sciences
Marquette University School of Dentistry
1801 West Wisconsin Avenue
Milwaukee, WI 53233
Phone: 414-288-6089
Fax: 414-288-3586
Email: anthony.iacopino@marquette.edu
Since its founding, a defining mission of the University of Colorado School of Dentistry (UCSD) has been to provide service to the state of Colorado. Prior to 1986, graduates of UCSD could repay a portion of their educational indebtedness by practicing in an underserved area of Colorado or by donating dental services to high-need or indigent populations. In 1986, a coordinated multilevel strategy was devised to place dental service payback within the four-year curriculum, giving birth to the Advanced Clinical Training and Service (ACTS) Program. This program provides senior dental students training and experience through fieldwork in service learning environments outside of the dental school setting.

Since 2002, approximately one-fourth of the UCSD senior dental students have provided notable community service and significantly developed their clinical skills by treating older adults who are participants in a Denver day/health center program. Total Longterm Care (TLC), a nonprofit organization, was established in 1991 as Colorado’s PACE provider. PACE (Program of All-Inclusive Care for the Elderly) is an innovative system of care located throughout the United States that is designed to meet the needs of nursing home eligible individuals. By combining interdisciplinary medical care, community-based home and health care services, and day programs, PACE providers help these individuals stay in their own homes and communities and out of nursing homes.

Once a person enrolls, comprehensive dental care is provided through TLC at no additional cost to the participant. UCSD dental students operate two separate state-of-the-art dental clinics while they are on their five-week rotations. Prior to their rotations, students receive a formal TLC orientation addressing elder abuse topics, confidentiality and code of conduct, OSHA and emergency preparedness, interdisciplinary team overview, and HIPAA guidelines. Dental students are required to work as a team in the dental clinic to provide comprehensive dental treatment. The faculty supervisor, who receives salary support as the dental director of TLC, helps the students focus on integrating and reinforcing concepts emphasized in didactic coursework into the clinical setting of the TLC dental clinics. Students attend interdisciplinary team meetings and are provided the opportunity to work closely with geriatric health care providers (e.g., geriatricians, nurses, social workers, physical and occupational therapists, nutritionists, mental health professionals) to improve their assessment, diagnostic, treatment planning, and geriatric patient management capacities. The students get significant opportunities to enhance gerodontic clinical skills competencies in a variety of clinical disciplines.

Outcomes

Enhanced Student Competencies

As a result of this extramural experience, fourth-year dental students have developed and refined a number of important competencies. These competencies include:

1. Establish and maintain effective communication with the elderly patient, family members, and other care providers.
2. Assess the physical and psychosocial condition of the elderly patient.

3. Perform a comprehensive health history, working with TLC health care providers to obtain medical and other consultations when appropriate, and make appropriate referrals of older patients to dental and medical specialists.

4. Evaluate and document existing dental restorations, protheses, oral pathologies, dental functional status including chewing capacity, symptomatology including xerostomia, and esthetic status.

5. Develop treatment plans based on determining factors, treatment objectives, and the level of care required by the elderly patient.

7. Assess patient cognitive capacity, and provide and document appropriate verbal and written informed consent from patient, medical power of attorney prior to treatment, or both.

8. Describe and utilize appropriate stress reduction techniques in the effective management of elderly patients, including both nonpharmacologic and pharmacologic interventions.

9. Demonstrate the ability to provide comprehensive dental care to older adults including extensive use of glass ionomers, techniques for enhanced retention of large restorations, root canal therapy on sclerosed canals, extraction of ankylosed teeth, use of artificial bone substitutes for ridge height maintenance, management of bleeding after surgery, treatment of fungal infections, and fabrication of removable protheses on atrophic ridges.

10. Provide maintenance and preventive instructions for patients receiving fixed or removable prosthodontic devices.

11. Provide education to elderly patients about preventative measures to maintain their dentition, and write prescriptions for oral chemotherapeutic agents.

12. Perform wheelchair transfers to and from the dental chair.

Student surveys have confirmed the educational merit of this experience. Student responses have shown that nearly 90% of the UCSD senior class participants “strongly agree” (1-5 Likert scale; \( x=1.13 \)) that this “practice/site provided a good learning environment” and that this clinical association enhanced “the quality of … clinical judgment and skills.” Additionally, as a result of this service learning experience, 73% stated that this rotation helped them “very much” to understand their “limitations as a clinician” (1-4 Likert scale; \( x=1.22 \)). Approximately 90% affirmed that this gerodontic experience “very much” increased their “comfort with patients who have difficulty getting care” (1-4 Likert scale; \( x=1.13 \)).

Service-Related Outcomes

During the TLC rotation, each dental student (class of ’06) typically treated about 20 patients per week. In descending order, treatment consisted of removable prosthetics, restorative, oral surgery, and preventive or diagnostic procedures. The average donated dental services
production during the rotation based on community UCR fees was approximately $14,000 per each UCSD fourth-year student.

Contact

Douglas Berkey, D.M.D., M.P.H., M.S.
Professor, Department of Applied Dentistry
University of Colorado School of Dentistry
Mail Stop F843, P.O. Box 6508
Aurora, CO 80045
Phone: 303-724-7030
Fax: 303-724-7039
Email: douglas.berkey@uchsc.edu
The University of Iowa College of Dentistry

Geriatric and Special Needs Program
(Geriatric Mobile Unit and Special Care Clinic)

The Geriatric and Special Needs Program is one of the longest-running community outreach programs in the College of Dentistry and The University of Iowa. It is composed of the Geriatric Mobile Unit (GMU) and the Special Care Clinic (SCC). First established in the early 1980s, the GMU provides comprehensive dental care for 10 nursing homes within a 40-mile radius of Iowa City. The GMU has a 30-foot motor home that is used to transport portable dental equipment to the nursing home, which is then set up in one or two rooms at the nursing home for several weeks. The use of portable x-ray equipment and high-speed dental units enables the four dental students and supervising faculty to provide high-level comprehensive dental care for residents. The Special Care Clinic was established in the late 1980s to support the Geriatric Mobile Unit. The SCC has eight dental chairs and provides emergency and comprehensive dental care for frail and dependent patients with special dental needs, including those adults and older adults with complex medical conditions, physical and intellectual disabilities, and psychiatric conditions.

The dental students spend a five-week full-time rotation in the GMU and the SCC. A coordinated GMU dental hygiene nursing home program also visits all the nursing homes on a six-monthly recall program. The GMU and SCC also provide a hands-on interdisciplinary clinical educational experience for geriatric dental fellows and geriatric medical fellows, in addition to dental hygiene, dental assisting, and pharmacy students.

In 1999, the American Dental Association awarded the GMU its top Geriatric Oral Health Care Award. In 2000, the University of Iowa Council on Disability Awareness recognized the College of Dentistry’s Geriatric and Special Care Program with one of two achievement awards presented to people and programs that provide outstanding support to people with disabilities.

Outcomes

The GMU and SCC clinical experiences produce a cadre of dentists, geriatric fellows, dental assistants, and hygienists who have the training, experience, and confidence to care for nursing home patients and other patients with special dental needs. Specific behavioral and psychomotor objectives for this course include students’ having:

1. Knowledge of the characteristics and special needs of people who do not have ready access to dental care because of medical limitations, low income, disabling conditions, institutional or home confinement, or other limiting factors.

2. Knowledge of the barriers to dental care faced by various socioeconomic, cultural, and age groups and the factors that influence their use of dental services.

3. Knowledge of the resources available—at the federal, state, and local levels—that might be called upon or developed to help meet the dental needs of various segments of the population.
4. Knowledge of rational treatment plans (regarding procedure selection, sequencing, length of appointment, etc.) based on patients' individual needs, such as psychomotor abilities, mental and physical health status, financial status, and drug regimens.

5. Skills in diagnostic judgment, management, and communication with patients, care providers, staff members, and the professional community.

6. Skills in planning, preparing, presenting, and evaluating dental health programs for groups in the community (for example, staff in-service for nursing homes and preschool presentations).

7. Demonstrated the ability to practice routine clinical dentistry procedures (including restorative, prosthodontic, endodontic, periodontal, oral surgery, and esthetic procedures) in a professional manner toward all patients, including members of diverse and vulnerable populations, by performing ethically and legally.

8. Demonstrated appropriate ethical and professional values in their clinical conduct and interactions with patients, the public, other students, and faculty members, including understanding under what circumstances to consult with and refer to other health care providers.

9. Demonstrated the ability to perform self-directed improvement and learning for future continual advancement of their professional knowledge and skills of the practice of dentistry by being familiar with resources providing current information about medical diseases and drug actions and interactions.

Contact

Jane Chalmers, B.D.Sc., M.S., Ph.D.
Associate Professor and Director, Geriatric and Special Care Program
Preventive and Community Dentistry
The University of Iowa College of Dentistry
100 Dental Science Building
Iowa City, IA 52242
Phone: 319-335-7203
Email: jane-chalmers@uiowa.edu
Certificate in Geriatric Dentistry

In response to the current and anticipated educational needs in the area of gerontology, members of the University of Pittsburgh Council on Aging collaborated to create a universitywide Graduate Certificate in Gerontology. The program was designed to serve professionals in diverse disciplines who are interested in acquiring basic knowledge about gerontology and geriatrics and gaining specialized knowledge of aging and aging processes in their particular fields of practice. Led by the School of Dental Medicine’s Liaison to the Council on Aging, the Graduate Certificate in Geriatric Dentistry was developed by a working group of dental faculty and the Co-Director of the Geriatric Education Center of Pennsylvania, a component of the University Center for Social and Urban Research. Support to create the curriculum for the Graduate Certificate in Geriatric Dentistry was provided in part by a grant from the Health Services and Resources Administration.

The five courses that comprise the curriculum for the Graduate Certificate in Geriatric Dentistry are Dental Care for the Geriatric Population, Aging and Oral Health, Age-Related Changes in the Tissues of the Oral Cavity, Medical and Therapeutic Considerations of Geriatric Dental Patients, and Clinical Geriatric Dentistry. Two of these courses, Aging and Oral Health and Age-Related Changes in the Tissues of the Oral Cavity, are offered online. Both Dental Care for the Geriatric Population and Clinical Geriatric Dentistry require the dental student to provide direct care to a medically compromised older adult in the dental school clinic, offsite in another facility such as a nursing home, or both.

The Curriculum Committee of the School of Dental Medicine drafted guidelines for tracking student participation in the Graduate Certificate Program. The faculty advisor and module team leader must provide, in writing, an assessment of whether each student is prepared academically and clinically before registration in these courses can be completed. These students are required to have a minimum cumulative GPA of 3.00, be current with their patient care responsibilities, have passed part one of the National Dental Boards, and not be on academic probation or under review for issues of academic integrity. Students enrolled in the Graduate Certificate in Geriatric Dentistry must meet with their faculty advisor once per semester to assess their progress in the program.

Outcomes

To date, three students have enrolled in the Graduate Certificate in Geriatric Dentistry program. The first student to complete the program is expected to graduate with the School of Dental Medicine Class of 2007. The other two dental students are in their third year of dental school and anticipate completion of the requirements for the certificate in 2008. Future outcome assessments will include data sets. Initially, a survey of second-year dental students will be conducted following a brief presentation describing the Graduate Certificate in Geriatric Dentistry to determine the number of second-year dental students who might be interested in enrolling in the program when they begin their third year. Another data set will be the number of third-year dental students who enroll, while the third data set will provide the number of dental students who complete the program. Additional outcome information will be collected from those students who earned the Certificate in followup surveys one, three, and five years after their graduations. These surveys will inquire as to the extent of geriatric dentistry in their practices, additional continuing education completed that is relevant to the treatment of medically
compromised patients, and whether they provide any treatment in nursing homes or private homes.

In all, six Specialization Tracks were developed—Dentistry, Law, Nursing, Occupational Therapy/Rehabilitation, Public Health, and Social Work—in addition to a multidisciplinary track. Each track requires completion of a minimum of 15 credits. All students are required to select six to seven credits from a list of required courses. These include Gerontology: Perspectives on Aging (three credits), Seminar Series on Aging (one credit), and Bioethics Seminar (three credits). The first two of these courses are taught by faculty in the School of Dental Medicine and are offered online. More than 20 nondental students have enrolled in these two courses in the last two years. In this way, dental faculty have interacted with students pursuing the Graduate Certificate who have professional interests in social work, nursing, or law. Dental students also enrolled in these required courses. This mix of professions in the required courses offers a unique opportunity for students from different disciplines to interact and learn about each other’s perspectives on health care for the older adult. Regardless of the chosen track, administrative support is provided by staff of the University of Pittsburgh’s Center for Social and Urban Research, which is the campus office of the Geriatric Education Center of Pennsylvania.

The presence of the Geriatric Education Center of Pennsylvania on the University of Pittsburgh campus and the interest of its directors in including dental medicine within its scope were the major factors in the establishment of the Dental Track in the University of Pittsburgh’s Graduate Certificate in Gerontology. In addition, the multidisciplinary composition of the Council on Aging within the newly created University of Pittsburgh Institute on Aging contributed to the integration of the faculty of the School of Dental Medicine into the teaching faculty of the Graduate Certificate in Gerontology. To create a similar program at other dental schools, the involvement of the other health science schools, as well as the schools of law, public health, and social work, is advised. Satellite dental clinics, nearby nursing homes, local dental societies, and government agencies serving the needs of older adults could also be invited partners in the design and realization of a graduate program in geriatric dentistry.

Contact

Kathleen Vergona, M.P.H., Ph.D.
Associate Professor
University of Pittsburgh School of Dental Medicine
630 Salk Hall
Pittsburgh, PA 15261
Phone: 412-648-8504
Fax: 412-624-3080
Email: kav1@pitt.edu
Additional Resources

Associations and Other Organizations

Alzheimer’s Association
225 N. Michigan Avenue, Floor 17
Chicago, IL 60601
1-800-272-3900
http://www.alz.org

The American Academy of Oral Medicine
P.O. Box 2016
Edmonds, WA 98020
425-778-6162
http://www.aaom.com

American Association of Homes and Services for the Aging
2519 Connecticut Avenue, NW
Washington, DC 20008
202-783-2242
http://www.aahsa.org

American Association of Retired Persons
601 E Street, NW
Washington, DC 20049
1-888-687-2277
http://www.aarp.org

American Association of Public Health Dentistry
National Office
P.O. Box 7536
Springfield, IL 62791
217-391-0218
http://www.aaphd.org

American Bar Association
Commission on Law and Aging
740 15th Street, NW
Washington, DC 20005
202-662-1000
http://www.abanet.org/aging

American Cancer Society
1599 Clifton Road, NE
Atlanta, GA 30329
1-800-ACS-2345
http://www.cancer.org
American College of Health Care Administrators
300 N Lee Street, Suite 301
Alexandria, VA 22314
703-739-7900
http://www.achca.org

American Dental Association
211 East Chicago Avenue
Chicago, IL 60611
http://www.ada.org

American Dental Hygienists' Association
444 North Michigan Avenue, Suite 3400
Chicago, IL 60611
312-440-8900
http://www.adha.org

American Diabetes Association
1701 North Beauregard Street
Alexandria, VA 22311
1-800-342-2383
http://www.diabetes.org

American Dietetic Association
120 South Riverside Plaza, Suite 2000
Chicago, IL 60606
1-800-877-1600
http://www.eatright.org

American Geriatrics Society
The Empire State Building
350 Fifth Avenue, Suite 801
New York, NY 10118
212-308-1414
http://www.americangeriatrics.org

American Health Care Association
1201 L Street, NW
Washington, DC 20005
202-842-4444
http://www.ahca.org

American Heart Association
National Center
7272 Greenville Avenue
Dallas, TX 75231
1-800-242-8721
http://www.americanheart.org
American Hospital Association
One North Franklin
Chicago, IL 60606
312-422-3000
http://www.aha.org

American Public Health Association
800 I Street, NW
Washington, DC 20001
202-777-2742
http://www.apha.org

American Society on Aging
833 Market Street, Suite 511
San Francisco, CA 94103
415-974-9600
http://www.asaging.org

Arthritis Foundation
P.O. Box 7669
Atlanta, GA 30357
1-800-568-4045
http://www.arthritis.org

Asociación Nacional Pro Personas Mayores
National Association for Hispanic Elderly
234 East Colorado Boulevard, Suite 300
Pasadena, CA 91101
626-564-1988
http://www.anppm.org

Association for Gerontology in Higher Education
1030 15th Street, NW, Suite 240
Washington, DC 20005
202-289-9806
http://www.aghe.org

The Gerontological Society of America
1030 15th Street, NW, Suite 250
Washington, DC 20005
202-842-1275
http://www.geron.org

Gray Panthers
National Office
1612 K Street, NW, Suite 300
Washington, DC 20006
1-800-280-5362
http://www.graypanthers.org
National Archive of Computerized Data on Aging
P.O. Box 1248
Ann Arbor, MI 48106
734-647-5000
http://www.icpsr.umich.edu/NACDA

National Association for Home Care & Hospice
228 Seventh Street, SE
Washington, DC 20003
202-547-7424
http://www.nahc.org

National Association of Area Agencies on Aging
1730 Rhode Island Avenue, NW, Suite 1200
Washington, DC 20036
202-872-0888
http://www.n4a.org

National Association of Social Workers
750 First Street, NW, Suite 700
Washington, DC 20002
202-408-8600
http://www.socialworkers.org

National Association of State Units on Aging
1201 15th Street, NW, Suite 350
Washington, DC 20005
202-898-2578
http://www.nasua.org

The National Caucus and Center on Black Aged, Inc.
1220 L Street, NW, Suite 800
Washington, DC 20005
202-637-8400
http://www.ncba-aged.org

National Citizen’s Coalition for Nursing Home Reform
1828 L Street, NW, Suite 801
Washington, DC 20036
202-332-2275
http://www.nccnhr.org

National Council on Aging
300 D Street, SW, Suite 801
Washington, DC 20024
202-479-1200
http://www.ncoa.org
The National Hospice and Palliative Care Organization
1700 Diagonal Road, Suite 625
Alexandria, VA 22314
703-837-1500
http://www.nhpco.org

National Indian Council on Aging
10501 Montgomery Boulevard, NE, Suite 210
Albuquerque, NM 87111
505-292-2001
http://www.nicoa.org

National Senior Citizens Law Center
1101 14th Street, NW, Suite 400
Washington, DC 20005
202-289-6976
http://www.nsclc.org

Older Women’s League
3300 N. Fairfax Drive, Suite 218
Arlington, VA 22201
703-812-7990
http://www.owl-national.org

Parkinson’s Disease Foundation
1359 Broadway, Suite 1509
New York, NY 10018
1-800-457-6676
http://www.pdf.org

Special Care Dentistry Association
401 North Michigan Avenue, Suite 2200
Chicago, IL 60611
312-527-6764
http://www.scdonline.org

Federal Agencies

Administration on Aging
U.S. Department of Health & Human Services
One Massachusetts Avenue, Suites 4100 & 5100
Washington, DC 20201
202-619-0724
http://www.aoa.gov

Agency for Healthcare Research and Quality
U.S. Department of Health & Human Services
540 Gaither Road
Rockville, MD 20850
301-427-1364
http://www.ahrq.gov