

SYLLABUS

COURSE: DENF 2721 Periodontics I: Diagnosis and Treatment Planning
SEMESTER: Fall
CREDIT HOURS: 1.0

REVISED: 2006
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COURSE DIRECTOR: James A. Katancik, D.D.S., Ph.D.

GOAL

Periodontics is one of the cornerstones of the practice of dentistry. This is as true in the generalist's office as it is for the periodontist. This course is the first of five Periodontics courses to be given in the next two years. The goal of this course is to review and expand your knowledge on the biology of the healthy periodontium. It is also the aim of this course to introduce you to the current classification of periodontal diseases and provide you with a fundamental knowledge of the epidemiology, etiology, microbiology and immunology of periodontal diseases. Basic information will be integrated with necessary clinical skills to evaluate and diagnose all currently recognized forms of periodontal diseases. This includes the ability to recognize the less common forms of gingivitis and periodontitis and those systemic condition forms of which may influence the initiation, progression, or treatment of periodontal diseases.

The material presented in this course is directly supported by your previous knowledge acquired in microbiology (DENS 1551), and oral histology and embryology (DENS 1503). Also your biochemistry (DENF 1521) knowledge will provide you with a better understanding of the pathogenesis of periodontal diseases. Concomitantly to this course you will be taking course DENF 2704, which complements the information received on DENF 2721. Students are responsible for the knowledge acquired in both DENF 2704 and DENF 2721. These courses will provide a foundation of knowledge for future Periodontics courses.

When you have successfully completed this course, you, the student, will be aware of the biology of the periodontium and pathology of periodontal diseases. You will be able to diagnose all forms of periodontal diseases, to perform a clinical examination and to understand the current biological rationale for the development of periodontal diseases. In addition, students will be able to use this knowledge in future Periodontics courses that cover periodontal prevention and therapy.

OBJECTIVES

I. THE SPECIALTY OF PERIODONTOLOGY/EPIDEMIOLOGY OF GINGIVAL AND PERIODONTAL DISEASES

1. Describe procedures related to the specialty of Periodontology.
2. Define Epidemiology.
3. Define: Prevalence, Incidence, Sensitivity, and Specificity.
4. Describe the prevalence of gingivitis.
5. Describe the prevalence of periodontitis.
6. Discuss the relationship between periodontal disease and dental caries.

II. ANATOMY AND ULTRASTRUCTURE OF THE PERIODONTIUM

1. Describe the normal clinical features of the gingiva:
 - 1.1 Marginal gingiva
 - 1.2 Gingival sulcus
 - 1.3 Attached gingiva
 - 1.4 Interdental gingiva
2. Describe the normal microscopic features of the gingiva.
 - 2.1 Gingival epithelium:
 - 2.1.1 General aspects
 - 2.1.2 Structural and metabolic characteristics
 - 2.2 Gingival connective tissue:
 - 2.2.1 Gingival collagen fibers
 - 2.2.2 Connective tissue cellular elements
 - 2.2.3 Blood supply, lymphatics, and nerves
3. Describe the correlation between normal clinical and microscopic features.
 - 3.1 Color
 - 3.1.1 Physiologic pigmentation
 - 3.1.2 Size
 - 3.1.3 Contour
 - 3.1.4 Shape
 - 3.1.5 Consistency
 - 3.1.6 Surface texture
 - 3.1.7 Position
 - 3.1.8 Continuous tooth eruption
4. Describe the tooth supporting structures.

- 4.1 Periodontal ligament
- 4.2 Functions of periodontal ligament
- 4.3 Cementum
- 4.4 Alveolar process
- 4.5 Development of attachment apparatus
- 4.6 Vascularization of supporting structures

III. PERIODONTAL MICROBIOLOGY

1. Describe the microbial specificity of periodontal diseases.
2. Describe the specific and nonspecific plaque hypothesis.
3. List the main microorganisms associated with healthy and diseased periodontium.
 - 3.1 Periodontal health
 - 3.2 Gingivitis
 - 3.3 Localized Aggressive Periodontitis
 - 3.4 Periodontitis as a Manifestation of Systemic Disease
 - 3.5 Necrotizing Periodontal Diseases
 - 3.6 Abscesses of the Periodontium
4. Discuss the conclusions from the studies of the association of microorganisms with periodontal diseases.
5. Describe the criteria for identification of periodontal pathogens.
6. Explain the virulence factors of periodontal pathogens.
7. Explain the future advances in the area of periodontal microbiology.

IV. THE ROLE OF DENTAL PLAQUE AND CALCULUS IN PERIODONTAL DISEASES

1. Define dental plaque: a host associated biofilm.
 - 1.1 Macroscopic structure and composition
 - 1.2 Formation of dental plaque:
 - 1.2.1 Dental pellicle
 - 1.2.2 Initial colonization
 - 1.2.3 Secondary colonization
 - 1.3 Microscopic structure and physiologic properties
 - 1.4 Significance of the biofilm environment
2. Define dental calculus:
 - 2.1 Supragingival and subgingival
 - 2.2 Describe the prevalence
 - 2.3 Describe the composition
 - 2.4 Describe the attachment and formation
 - 2.4.1 Theories on mineralization
 - 2.4.2 Role of microorganisms on mineralization
 - 2.4.3 Describe the etiologic significance of calculus

3. Define materia alba.
4. Describe the role of food debris in the etiology of periodontal diseases.
5. Discuss dental stains and their cause.

V. HOST RESPONSE IN PERIODONTAL DISEASE

1. Define and explain the function of these important cells of immunity and inflammation:
 - 1.1 Mast Cells
 - 1.2 Dermal Dendrocytes
 - 1.3 Peripheral Dendritic Cells
 - 1.4 Neutrophils and Monocytes/Macrophages
 - 1.5 Lymphocytes
 - 1.6 T and B Cells
 - 1.7 Natural Killer Cells
2. Define and explain the functions of the following:
 - 2.1 Complement
 - 2.2 Transendothelial migration
 - 2.3 Leukocyte functions
 - 2.3.1 Chemotaxis
 - 2.3.2 Phagocytosis
 - 2.3.3 Antigen processing and presentation
 - 2.4 Specific immune responses
 - 2.5 T-cell responses
 - 2.6 B-cell responses and antibodies
3. Explain the microbiologic aspects of the microbial-host interaction.
4. Explain the immunologic aspects of the microbial interaction with the host.
5. Describe the microbiology and immunology in gingival health.
6. Describe the microbiology and immunology in periodontal diseases.
 - 6.1 Gingivitis
 - 6.2 Chronic Periodontitis
 - 6.3 Aggressive Periodontitis
 - 6.4 Necrotizing Periodontal Diseases
 - 6.5 Periodontal Abscesses

VI. CLINICAL PARAMETERS FOR THE DIAGNOSIS OF PERIODONTAL DISEASE I

1. Compare and contrast a comprehensive oral evaluation and a comprehensive periodontal evaluation.
2. Describe how to use of the periodontal instrumentarium during a periodontal clinical examination. Include the following:
 - 2.1 Periodontal probes (steel and plastic)

- 2.2 Nabers probe
 - 2.3 Explorer
3. Upon examination of the teeth, evaluate the diagnostic significance of the following findings:
 - 3.1 Dental stains
 - 3.2 Tooth hypersensitivity
 - 3.3 Proximal contact relationships
 - 3.4 Tooth mobility (physiologic and pathologic)
 - 3.5 Pathologic migration of teeth
 - 3.7 Sensitivity to percussion
 4. Upon examination of the periodontium, compare and contrast the gingival tissues/structures (free/marginal gingiva, interdental/papillary gingiva, attached gingiva, alveolar mucosa) in healthy and diseased states, in relation to:
 - 4.1 Color
 - 4.2 Contour/position
 - 4.3 Consistency
 - 4.4 Surface texture
 5. Describe the anatomical features of the mucogingival junction.
 6. Compare and contrast the width of the keratinized gingiva with the width of the attached gingiva.
 7. Describe how to examine and evaluate periodontal pockets. Include the following:
 - 7.1 Definitions: gingival/pseudopocket vs. periodontal (suprabony and intrabony)
 - 7.2 Signs and symptoms
 - 7.3 Detection of pockets (pocket probing)
 - 7.4 Probing technique around teeth and implants
 - 7.5 Bleeding on probing and percentage of sites with bleeding on probing
 - 7.6 Determination of disease activity
 8. Describe how to examine and evaluate the level of attachment (clinical attachment level measurement). Include the following:
 - 8.1 Determination of the level of attachment and relative attachment measurements
 - 8.2 Landmarks to aid in the assessment of the level of attachment
 - 8.3 Gingival recession
 - 8.4 Incidental attachment loss

VII. CLINICAL PARAMETERS FOR THE DIAGNOSIS OF PERIODONTAL DISEASE II

1. Define the different grades/classes of furcation involvement.
2. Determine the significance of suppuration.
3. Describe how to evaluate the presence of supragingival plaque by using "The Plaque Control Record".
4. Describe the technique to identify the presence of supra and subgingival calculus.

5. Describe how to perform and evaluate a periodontal clinical examination utilizing the UTDB chart.
6. Describe how to perform and interpret a clinical screening using the Periodontal Screening and Recording (PSR) system.

VIII. PERIODONTAL RADIOGRAPHIC EXAMINATION

1. Explain the importance of radiographs in the diagnosis of periodontal disease.
2. Describe the main characteristics observed in normal interdental septa.
3. Explain the distortions that are produced by variations in radiographic technique.
4. Describe the "bone destruction" in periodontal disease.
5. Describe the following radiographic changes seen in Periodontitis:
 - 5.1 Interdental craters
 - 5.2 Furcation involvement
 - 5.3 Periodontal abscess
 - 5.4 Aggressive Periodontitis
 - 5.5 Trauma from occlusion
6. Explain the additional radiographic criteria used in the diagnosis of periodontal disease:
 - 6.1 Radiographic horizontal line across the roots
 - 6.2 Vessel canals in the alveolar bone
 - 6.3 Differentiation between treated and untreated periodontal disease

IX. Risk Factors and Risk Indicators in Periodontal Disease

1. Define what are risk factors and risk indicators in general.
2. Define and list the main risk elements for periodontal disease.
 - 2.1 Factors
 - 2.2 Determinants/Background Characteristics
 - 2.3 Indicators
 - 2.4 Markers/Predictors
3. Discuss the process of clinical risk assessment for periodontal disease
4. List the effects of smoking on the prevalence and severity of periodontal diseases.
 - 4.1 Gingivitis
 - 4.2 Periodontitis
5. List the effects of smoking on the etiology and pathogenesis of periodontal disease.
 - 5.1 Microbiology
 - 5.2 Immunology
 - 5.3 Physiology
6. List the effects of smoking on the response to periodontal therapy

- 6.1 Non-surgical
 - 6.2 Surgical Therapy and Implants
 - 6.3 Maintenance Therapy
 - 6.4 Recurrent (Refractory) Disease
7. List the genetic and inherited disorders associated with aggressive periodontitis (previously known as early onset periodontitis)
8. Discuss the role of genetics in chronic Periodontitis.

X. PERIODONTAL MEDICINE

1. Cardiovascular Disease
- 1.1 Describe the current relevance and historical perspectives of periodontal medicine.
 - 1.2 Describe the mechanisms and evidence supporting an association between periodontal and cardiovascular diseases:
 - 1.2.1 Inflammation
 - 1.2.2 Epidemiology
 - 1.2.3 Animal studies
 - 1.2.4 Direct and indirect mechanisms
 - 1.3. Discuss the management of patients with periodontal and cardiovascular disease.
2. Respiratory Diseases
- 2.1 Describe the importance of chronic obstructive pulmonary disease (COPD) in the population.
 - 2.2 Describe the association of periodontal and respiratory diseases.
 - 2.3 Discuss the management of periodontitis in patients with COPD.
3. Diabetes Mellitus
- 3.1 Describe the basis for the diagnosis and management of diabetes mellitus.
 - 3.2 Discuss the association of diabetes mellitus and periodontal diseases.
 - 3.3 Describe the dental treatment considerations in the patient with diabetes mellitus.
 - 3.4 Discuss the management of diabetic emergencies in the dental office.
4. Periodontitis and the Female Patient
- 4.1 Describe the relationship between periodontal and systemic health in the female patient:
 - 4.1.1 Pregnancy
 - 4.1.2 Osteoporosis
 - 4.1.3 Pre-term low birth weight births

XI. DIAGNOSIS AND CLASSIFICATION OF PERIODONTAL DISEASES I

1. Describe the basic clinical and radiographic findings of gingivitis and periodontitis.

2. Describe the American Academy of Periodontology (AAP) and the American Dental Association (ADA) classification of periodontal diseases based on tissue destruction. Give the main clinical and radiographic findings for the following case types:
 - 2.1 Type I – Gingivitis
 - 2.2 Type II – Incipient Periodontitis
 - 2.3 Type III – Moderate Periodontitis
 - 2.4 Type IV – Advanced Periodontitis
 - 2.5 Type V – Refractory Periodontitis

XII. DIAGNOSIS AND CLASSIFICATION OF PERIODONTAL DISEASES II

1. Describe the features of the following diseases and conditions affecting the periodontium. Contrast and compare the aspects of these conditions when developing a periodontal differential diagnosis:
 - 1.1 Gingival diseases associated with plaque
 - 1.2 Gingival diseases not associated with plaque
 - 1.3 Chronic periodontitis
 - 1.4 Aggressive periodontitis
 - 1.5 Periodontitis as a manifestation of systemic diseases
 - 1.6 Necrotizing periodontal diseases
 - 1.7 Abscesses of the periodontium
 - 1.8 Periodontitis associated with endodontic lesions
 - 1.9 Developmental or acquired deformities and conditions

XIII. PERIODONTAL PROGNOSIS

1. Define the term prognosis.
2. Contrast and compare the following two aspects when determining the periodontal prognosis:
 - 2.1 Overall prognosis
 - 2.2 Individual tooth prognosis
3. Explain why the following factors should be taken into consideration, when determining the overall prognosis of a periodontitis patient. Include:
 - 3.1 Overall clinical factors (patient age, disease severity, plaque control, patient compliance/ cooperation)
 - 3.2 Systemic and environmental factors (smoking, systemic disease or condition, genetic factors, stress)
 - 3.3 Local factors (plaque and calculus, subgingival restorations, anatomic factors, tooth mobility)
 - 3.4 Prosthetic and restorative factors (abutment selection, caries, nonvital teeth, root resorption)
4. Explain the terms utilized to establish a prognosis. Include the following:
 - 4.1 Good
 - 4.2 Fair
 - 4.3 Questionable
 - 4.4 Hopeless
5. Explain the relationship between diagnosis and prognosis.

6. Evaluate the prognosis for patients with gingival disease. Include the following:
 - 6.1 Dental plaque-induced gingival diseases
 - 6.2 Non-plaque induced gingival lesions
7. Evaluate the prognosis for patients with periodontitis. Include the following:
 - 7.1 Chronic periodontitis
 - 7.2 Aggressive periodontitis
 - 7.3 Periodontitis as a manifestation of systemic diseases
 - 7.4 Necrotizing periodontal diseases
8. Explain the concept of short and long-term prognoses

RESOURCES

I. Media Resources

A. Printed media

1. Required textbook
Michael G. Newman, Henry H. Takei, Fermin A. Carranza, editors
Carranza's Clinical Periodontology, 10th edition
Saunders Elsevier, 2006
2. Article
O'Leary TJ, Drake RB, Taylor JE
"The Plaque Control Record"
J Periodontol. 1972; 43: 38.

B. Electronic media

BlackboardCourseInfo Website: <http://blackboard.uth.tmc.edu>
PowerPoint presentations will be available on BlackBoard one week prior to lectures.

II. Human Resources

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STUDY PLAN AND REQUIREMENTS

Prepare for this course by reading your syllabus, reviewing the objectives and thoroughly reading the chapter from the required textbook before each lecture. Bring your syllabus to class and organize a Periodontics course folder for your class notations.

Students are required to be familiar with the presented topic before each lecture. Presentations will attempt to clarify the important areas of each topic and answer any questions that the students may have after reading the chapter(s) concerning the specific lecture.

In order to successfully complete this course the student will need to:

1. Attend all DENF 2721 Periodontics I: Diagnosis and Treatment Planning.
2. Read the textbook or any additional assignments before going to each lecture. Read the objectives of each lecture before its presentation.
3. Review the material after presentation in class and the book chapter(s) assigned; complete the possible handouts or notes presented by the lecturers.

This course must be successfully completed prior to DENS 2722 Periodontics II: Hygienic Phase of Periodontal Therapy, as well as seeing any patients in the clinic, either in the Dental Branch or in any of its extramural facilities.

NOTE: During course DENF 2704 Introduction to Clinic, you will participate in lab/clinic sessions to learn instrumentation and how to perform many of the basic diagnostic procedures discussed in this Periodontics I course.

**DENF 2721 PERIODONTICS I: DIAGNOSIS AND TREATMENT PLANNING
2009 Fall Semester Schedule**

Wednesday, 8.00-8.50 am, lectures in Room 132, *with exceptions* see schedule.
Final Examination:

Session	Date	Topic	Faculty
1	Aug 19	Introduction to Periodontology Normal Periodontium – Anatomy, development, and physiology Epidemiology of Periodontal Disease <i>Chapters 4 and 5: pages 46-92 + BlackBoard*</i> <i>Chapter 8: pages 110-132 + BlackBoard*</i>	Katancik
2	Aug 26	Etiology: Periodontal microbiology <i>Chapter 9: pages 152-169 + BlackBoard*</i>	Tribble
3	Sep 2	Etiology: Dental plaque and calculus/microbial biofilms and periodontal disease specific pathogens <i>Chapter 10: pages 170-192</i> <i>Chapter 9: pages 133-152 + BlackBoard*</i>	Tribble
4	Thu, Sep 10 3-3:50 pm	Immunology and inflammatory response – microbial/host interaction. <i>Chapter 12 & 13: pages 209-250 + BlackBoard*</i>	Gay
5	Sep 16	Clinical examination I <i>Chapter 41: pages 46-48, 61-63.</i> <i>Chapter 22: pages 364-372.</i> <i>Chapter 27: pages 434-436.</i> <i>Chapter 35: pages 546-554.</i> <i>Chapter 51: pages 749-750.</i> <i>BlackBoard*</i>	Anderson
6	Sep 23	Clinical examination II <i>Chapter 27: page 442,</i> <i>Chapter 35: pages 546-554.</i> <i>Article: O'Leary TJ, Drake RB, Taylor JE: The Plaque Control Record. J Periodontol 1972; 43:38.</i>	Anderson
7	Sep 30	Radiography for the periodontal examination - bone loss/patterns of loss <i>Chapter 36 & 37: pages 561-601,</i> <i>Clinical Guidelines for Periodontics + BlackBoard*</i>	Parthasarathy
9	Oct 7	Risk factors for Periodontal Disease <i>Chapters: 38: pages 602-608</i> <i>Chapter 14: pages 284-311</i> <i>Chapter 10: pages 171-173; 175-179 + BlackBoard*</i> <i>Chapter 11: pages 196-208</i>	Gay

Session	Date	Topic	Faculty
8	Oct 14	Mid-term Examination (one hour) Room 207	Katancik
10	Oct 21	Systemic factors, genetics, periodontal medicine I Chapter 17: pages 285-287, Periodontal Medicine + <i>BlackBoard</i> *	Katancik
11	Oct 28	Systemic factors, genetics, periodontal medicine II Chapter 18: pages 312-329, Periodontal Medicine + <i>BlackBoard</i> *	Katancik
12	Thu, Nov 5 3-3:50 pm	Diagnosis I <i>BlackBoard</i> + <i>AAP Classification</i>	Hanna
13	Thu, Nov 12 3-3:50 pm	Diagnosis II <i>Chapter 7: pages 100-109 + AAP Classification + BlackBoard</i> *	Hanna
14	Nov 18	Prognosis <i>Chapter 40: pages 614-625, BlackBoard</i> *	Anderson
15	Nov 25	Course Review: Case based Exercise Course evaluation	Katancik
16	Dec 2	FINAL EXAMINATION Room 207 One-hour, comprehensive, written exam	Katancik

* PowerPoint presentations will be available on BlackBoard one week prior to lectures.

EVALUATION METHODS

The students will be evaluated on the basis of two examinations given at the discretion of the lecturers. The dates of these exams can be found on the previous pages and in the Fall Semester Student Schedule. The final written examination is comprehensive, including all course material presented during the semester.

Each examination will consist of 50 multiple choice, true/false, fill in the blank and multiple/multiple choice questions. Questions in both midterm and final examinations may come from either the material given during the lecture (i.e. student notes and BlackBoard material) or the corresponding chapter(s) assigned for each lecture. Each question will be worth two points. The student must have a minimum average score of 70 points after taking the two tests and must not score less than 50 points in either of the two tests to successfully complete and pass this course.

A Pre-test in the beginning of the course will be conducted but will not affect your final grade in this course. Also, the last session before the exam will have some case based exercise and a course material overview.

The final grade for the Periodontics I course (DENF 2721) will be calculated as follows:

Points	% of Final Grade
Test #1 100 points	50%
Test #2 100 points	50%

Students who desire to individually review their course examinations must do so by arranging an appointment with the course director within 14 days of the date the exam grades were made available.

Attendance

Attendance is required at all scheduled lectures. Attendance will be checked at each lecture. As a matter of courtesy to the speaker and to get maximum benefit from the lecture, you should make every reasonable effort to arrive to class before the speaker begins the lecture. As a courtesy to your colleagues and to the speaker, unprofessional behavior outlined by the current *Student Guide to Academic Studies* will not be tolerated. The first occurrence will result in a warning. The second occurrence will result in your being dismissed from the class session. Examples of unprofessional behavior include (but are not limited to):

- audible signals on pagers or cellular phones during class.
- talking on cellular phones during class.
- leaving class after the presenter has started and before the presenter has concluded.
- taking handout materials before class starts but not attending the class.
- making disrespectful comments to classmates or instructors.
- carrying on conversations with classmates while the presenter is speaking.

Note: a grade of 50 points in either of the written examinations will cause an immediate action by the Periodontics course director, student and student's advisor. A remediation, study/training session with one of the periodontics faculty member and a written five-page paper about the topics lectured may be necessary in order to complete this remediation process. This paper will be reviewed by the course director, and a grade higher than 85 points will have to be obtained by the student to complete this

remediation process. However, your original grade will be the grade of record. If the final grade is below 70 points, the same remediation process will take place.