



## **DentEd Site Visit**

**Zentrum fur Zahn, Mund und Kieferheilkunde  
Justus Liebig Universitat**

**Giessen**

**17-21 June 2000**

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## Visitors

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## Section 1: Introduction

### Visitors' Comments

The visitors were unanimous in their praise of the documentation prepared before the visit. It was clear and provided an objective assessment of the strengths and weaknesses of the school. The program for the visit was meticulously prepared. This made the work of the visitors much easier.

#### 1.1 School Data

In 1607, Ludwig V of Hesse-Darmstadt founded the "Ludoviciana" as a Hessian-Lutheran regional university. Today it bears the name of its most renowned scientist, Justus Liebig, who was appointed professor in Giessen in 1824 at the age of 21. He is regarded as the founder of modern agricultural chemistry. Medicine was one of the original faculties at the founding of the university. The School of Dental Medicine is part of the Medical Faculty.

At first, the "Zahnärztliches Institut" (Dental Institute) was founded in 1940 as an exclusively clinical scientific research institute (without student training). In 1971, undergraduate dental education was introduced, bearing from the beginning a progressive structure of subjects. Besides the classical disciplines such as Conservative Dentistry, Prosthetic Dentistry, Orthodontics, Oral Surgery, and Maxillofacial Surgery, the subjects of Paediatric Dentistry, Periodontology, Preclinical Prosthodontics, and Experimental Dentistry were also represented by professors' chairs. In 1985, the Section of Endodontics was installed as an integral part of the Department of Conservative and Preventive Dentistry. In 1999 the Department of Experimental Dentistry was shut down and on October 1<sup>st</sup> 2000, the present Department of Oral Surgery will be integrated in the Department of Maxillofacial Surgery.

#### 1.2 Background

The city of Giessen with about 70,000 inhabitants is located right in the middle countryside at the river Lahn. With more than 21,000 students, Justus-Liebig-University is the second largest university in Hessen and ranks among the mid-sized universities of Germany. The courses of study offered in the various departments and scientific centres are comprehensive and multifarious. For example, at the JLU human, dental and veterinary medicine, the agricultural sciences and the nutritional and domestic sciences can all be studied. Particular importance is attached to interdisciplinary research and teaching. Several special fields of research may be mentioned here, such as the Pharmacology of Biological Macromolecules and Molecular Principles of Cytobiological Control Processes, or the research groups working on mechanisms of pathogenicity in viruses and respiratory insufficiency. To facilitate access to the university's pool of research and knowledge, the Justus Liebig University, together with the Philipps University in Marburg and the College for Applied Science in Giessen-Friedberg has established the "Transfer Centre for Central Hessen", which serves as a point of contact for the transfer of knowledge and technology in the region. This transfer centre is the successful result of a joint initiative taken by universities and colleges, chambers of trade and commerce, towns and districts of the Central Hessian region.

Last but not least we may mention "Rauischholzhausen castle". It is probably the most beautiful estate the JLU owns. Erected in the late nineteenth century in the midst of a spacious English garden, it gives the impression of a fairy-tale castle. Its magnificently decorated rooms provide the setting throughout the year for congresses, symposia and seminars, as well as for social and festive events.

#### 1.3 The Primary Function of the Institution

The School of Dental Medicine provides a five-year (10 semesters) dental education program ending with a final state board examination ("Staatsexamen") in the 11<sup>th</sup> semester. About 360 undergraduate students are being trained in the school today. Each semester, 32 - 33 (65 yearly) newcomers enrol in the first semester program. The curriculum as defined by a German federal law divides the program into a 2.5-year preclinical and a 2.5-year clinical section. The first five semesters include the education in basic medical sciences. It is designed to provide skilled and knowledgeable dentists for a society in

which special emphasis is given to prevention and to a health care delivery system rapidly increasing in complexity.

There are also about 30 postgraduate students. In anticipation of specialist recognition the School and Hospital has implemented training programs in Orthodontics, Oral Surgery and Maxillofacial Surgery. Furthermore, the school prepares programs for certified qualifications in Endodontics, Paediatric Dentistry, Conservative and Preventive Dentistry, Periodontology and Prosthodontics, which are recognised by the German societies of these subjects.

Each year we train approximately 9 dental assistants for about 3 years. The school also provides a continuing education programme for dental practitioners and dental nurses. Finally about five foreign undergraduate students every year are given the opportunity to complete a 4 to 6 week clinical practice.

### **Visitors' Comments**

The primary function of the institution, as it was presented to the visitors in the document and the site-visit, was clear and did not require further comments.

### **1.4 Curriculum**

The medical and dental school curriculum operates on the semester system. The academic year starts in the "Winter-Semester", in session from mid-October through mid-February, and ends in the "Sommer-Semester", in session from mid-April through mid-July. The Dental School curriculum is based on the requirements of Germany's dentists licensing regulations ("Approbationsordnung für Zahnärzte"). According to these regulations, a minimum of ten semesters, totalling in at least 5,000 hours of theoretical and practical instruction, is required of students of dentistry. Their curriculum is divided into three segments:

- The basic segment (minimum of two semesters) ends with the successful examination in basic science (Naturwissenschaftliche Vorprüfung).
- The preclinical segment (minimum of three semesters) is concluded with the successful examination of the "Physikum" (Zahnärztliche Vorprüfung).
- The clinical segment (minimum of five semesters) ends with the state board examination (Zahnärztliches Staatsexamen).

After passing the final part of the state board examination, full dental medical registration (Approbation als Zahnarzt) is granted by the appropriate state authority.

#### Lectures and courses

The "Vorlesung" is a lecture by the senior staff members (professors, associate professors). Lectures provide students with overviews of central topics of the subjects.

In "Seminare", emphasis is attached to clinical-theoretical interrelations. Here, students should actively participate in discussion and give short oral presentations.

In practical courses and exercises students work in laboratories or in hospitals under the guidance of experienced instructors.

### **Visitors' Comments**

The content of curriculum is currently controlled by federal legislation and a large amount of time is spent on basic medical science and technical procedures. National plans to rationalize this are supported and changes should be introduced as soon as possible.

A curriculum committee (or equivalent) should be developed to review the present arrangements and make recommendations for the future. The Committee should include the Heads of all the dental, basic and para-clinical science Departments.

A holistic approach to dental care should be encouraged. Staff from all departments should be included in this process.

At present students are not introduced to patient care until the beginning of the clinical course in the fourth year. This should be addressed as soon as legislation permits. In the mean time voluntary attendance in clinics by preclinical students should be encouraged.

## Section 2: Facilities

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### 2.1 Clinical Facilities

The Dental School is situated in two locations: the out-patient departments are in a six-storied building, together with the dental laboratories for students and the research laboratories. The second location - the Department of Maxillofacial Surgery with sectors for emergencies, preliminary examinations, in-patient and post-operative treatment, is situated in the building of the University Center of Surgery. On the whole 85 dental chairs are available for ambulatory dental care. 50 of these are used almost exclusively for student treatment. The remaining dental units used by clinical staff (dentists, dental-hygienists as well as dentist-student teams). During the last few years, the "pair strategy" has worked out best for student treatment, i.e. two students take turns in treating patients and assisting. The Dental School is proud of having replaced all old dental chairs by new ones during the last 10 years, due to a financing project supported by the Federal Research Department (Bundesforschungsministerium). Another project enabled us to renovate all work stations in our clinical laboratories five years ago. Furthermore, there is a well-equipped surgery theater in the ambulatory area, which is mainly used for oral rehabilitation under insufflation anaesthesia. Patients treated there are mostly handicapped children and adolescents or those with or pronounced carious destruction, showing great fear of dental treatment. The students appreciate assisting at these ITN rehabilitations. The in-patient ward has 17 beds, which are 90% occupied in the course of a year and, offering the possibility of bedside-teaching for students. Students (3<sup>rd</sup> and 4<sup>th</sup> year of studies) are also involved in the 24-hour emergency care.

#### 2.1.1 Total number of patient visits to the Dental School/Hospital per year by department or clinic

	Name/ Department/ Unit	Number of patients
1	Dept. of Conservative and Preventive Dentistry	6600
2	Dept. of Periodontology	3750
3	Dept. of Paediatric Dentistry	2150
4	Dept. of Preclinical Prosthodontics	700
5	Dept. of Prosthetic Dentistry	8450
6	Dept. of Orthodontics	7800
7	Dept. Of Oral Surgery	10 350 *
8	Dept. of Maxillo-Facial Surgery	2950 **
9		
10	* including first registration of patients of all departments	
11	** plus 686 In-Patients	
12		
Overall total (all departments)		

#### 2.1.2 Number of hours students spend in patient treatment\* (on average) per week

a) year 1	0
b) year 2	0
c) year 3	0
d) year 4	20
e) year 5	20

\* Patient treatment includes oral/dental treatment of actual patients and not simulation or time spent in pre-clinical laboratories.

## **2.2 Teaching Facilities**

There are three lecture theaters, one for 80 students, one for 40 students and one for 25 students. The largest theater is currently being converted to new EDP standards. The two others are to be adjusted within the next 2 - 3 years. We still need one or two smaller rooms equipped with computer workstations for seminars and for teaching small groups of students.

## **2.3 Teaching Laboratories**

60 new laboratory workstations (3 years old) are at our disposal for teaching the technology of dental materials and preclinical prosthodontics. The number of clinical laboratory workstations for students is 25 in the Department of Conservative Dentistry, 40 in the Department of Prosthetic Dentistry and 12 in the Department of Orthodontics.

### **2.3.1 Number of hours students spend in simulated patient treatment (on average) per week (such as manikin or phantom head laboratory)**

a) year 1	18 (1 <sup>st</sup> semester)
b) year 2	17-18
c) year 3	16 (6 <sup>th</sup> semester)
d) year 4	2 (8 <sup>th</sup> semester)
e) year 5	0

## **2.4 Research Laboratories**

A complete re-organisation is necessary due to the dissolution of the former Department of Experimental Dentistry in 1999. Furthermore, there have been several smaller research laboratories which are part of other departments. We are planning to make the research capacities available for concrete research projects and limited time periods. The basic equipment is to be supplied preferably to such projects for which financial support can be established. An additional laboratory set for dental materials research has just been installed, and a new cell culture and microbiological research laboratory (security standard II) will soon be completed.

## **2.5 Library**

The library of the Dental School is mainly a reference library; University staff and students studying for a doctorate are given the possibility to borrow books and journals within the school or to take photocopies.

Books and periodicals (annual subscription = 1 volume):	6,800 volumes
Currents subscriptions for periodicals:	66 periodicals

## **2.6 Additional Study Facilities**

All students in Giessen can get an e-mail account and internet access from home for a fee of 10 Euro per year. Internet access is free all over the medical campus. Computers are linked to the "Research Network" (Gissener Forschungsnetz). Additionally, the "Research Network" provides literature research and online access to hundreds of electronic full text medical journals. Especially for students there are computer facilities in the nearby situated Center for Data Processing and at the AGMA (Dean's Working group for Medical Education) providing new educational media. As an initial use of Computer based Training, students of dentistry have two hours of patient simulation programs (Part of the Course "Internal Medicine").

## **Visitors' Comments**

The clinical, laboratories, and research facilities are excellent. There is also a planned replacement program to maintain the high standard.

## Section 3: Administration and Organisation

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### 3.1 Clinical/Academic Organisational Structures for School and Hospital

#### 3.1.1 Faculties of University

- 01: Law
- 02: Economics
- 03: Social Sciences, Education, Art Education, Music and Sports
- 04: Psychology
- 05: Theology, History
- 06: German, English, Mediterranean and Eastern European Languages and Civilizations
- 07: Mathematics, Physics
- 08: Chemistry, Biology, Earth Sciences and Geography
- 09: Agriculture and Environmental Conservation; Nutrition and Home Economics
- 10: Veterinary Medicine
- 11: Human Medicine

#### 3.1.2 Structure of Faculty of Human Medicine

- 01: Center for Pathology
- 02: Center for Microbiology and Virology
- 03: Center for Ecology (Occupational and Social Medicine, Hygiene and Public Health, Statistics and Informatics, Medical Equipment, Forensic Medicine)
- 04: Center for Clinical Chemistry, Immunology and Human Genetics
- 05: Center for Radiology
- 06: Center for Internal Medicine (Cardiology, Pneumology, Endocrinology, Hematology and Oncology)
- 07: Center for Paediatrics
- 08: Center for Dermatology and Andrology
- 09: Center for Surgery, Anaesthesiology and Urology (General and Thorax Surgery, Heart and Vascular Surgery, Emergency Surgery, Anaesthesiology and Operative Intensive Medicine, Urological Clinic)
- 10: Center for Obstetrics and Gynaecology
- 11: Clinic for Otolaryngology
- 12: Clinic for Ophthalmology
- 13: Center of Orthopaedic Surgery
- 14: Center for Neurology and Neurosurgery
- 15: Center for Psychosomatic Medicine (Psychosomatic Medicine and Psychotherapy, Medical Psychology, Medical Sociology)
- 16: Center for Psychiatry
- 17: Center of Dental Medicine
- 18: Scientific Institutes
  - Institut for Anatomy and Cellbiology
  - Institut for Physiology
  - Institut for Biochemistry
  - Institut for Pharmacology
  - Institut for History of Medicine

#### Visitors' Comments

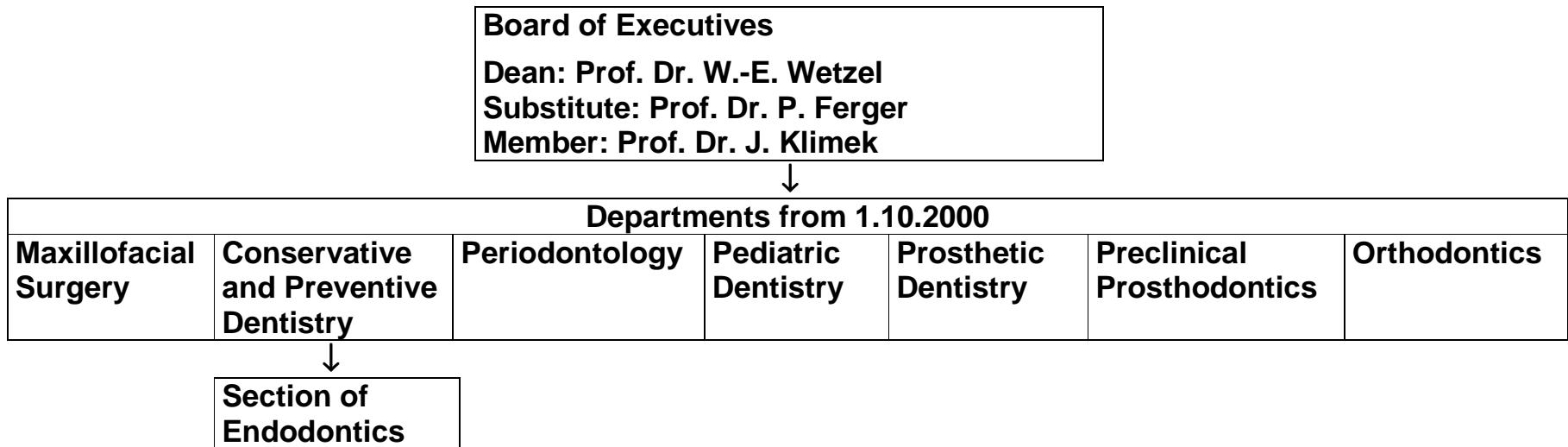
It is clear that the Faculty Board is the major decision-making body, but there is only one representative of the Dental School. An increase should be considered.

There are more academic departments than in most Dental School in Germany, which is commendable. The arrangements for Periodontology and Pediatric Dentistry are examples of good practice.

Although resources are under pressure there is a transparent formula led, budgetary system within the Faculty including the Dental School. This demonstrates good practice.

### **3.2 Clinical and Administrative Structures of Dental School**

## Structure of the Dental School



### Central structures

Premises and Equipment	Technical experts for equipment	Media expert	Photographic studio	Library	Planned: Computer expert	Nursing management
Students' organisation		Patients' reception and administration			Women's rights officer	

### **3.3 Information Technology**

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#### **Overview**

The dental school has an inhomogeneous hardware environment depending on the time of purchase of a specific machine. At the time being most of the computers are PC's (Pentium and above) running either Windows 95, 98 or Windows NT 4.0. Apple Computers are of no importance.

#### **Logical Network structure**

The medical branch of the Justus-Liebig-University including the Dental school maintains two physically separated networks due to requirements of medical data security: One network (Routine network) has no outside connection and is exclusively reserved to medical data. At present this network is used for Digora digital x-ray, patients administration and the evaluation of different medical documentation software systems. In the long run all radiographic procedures shall be transferred to digital imaging.

The other part of the network (scientific network) is reserved for scientific purposes and is directly connected to the internet. Most of the computers in the Dental school are connected to this network. The dental school has its own server (WIN NT) providing storage capacity for the different users.

#### **Physical network structure**

The dental school is connected to the backbone of the university network by glass fibre cables. The in house wiring consists of RJ 45. All dental units are provided with a two lane 10/100 Mbit twisted pair network connection interface. The Dental school has received a large grant form equipping all dental units with a computer as soon as a medical documentation system has been established.

#### **IT in dental education**

- The dental school has its own graphics departments providing several services for the lecturing staff: e.g. graphic design and slide exposure, professional scanning of photographs and slides, reproduction of x-rays.
- The main lecture hall is equipped with a beamer that not only allows computerized data projection but that is also connected to an in house TV-network thus enabling direct TV-transmissions from different operative theaters into the lecture hall.
- Students are trained in using the Digora digital x-ray system in the Dept. of Conservative Dentistry.
- In the Dept. of Prosthodontics the students learn to use a documentation software. Additionally an autotutorial information system for learning and repetition is under construction.

#### **Visitors' Comments**

The availability of IT hardware is more than adequate. The early introduction of student to the management of clinical data is an example of best practice.

The plans to improve student access to IT are also most encouraging but will be difficult to implement with present staff resources.

## Section 4: Staff

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### 4.1 Staff numbers in Dental School / Hospital (no double counting of individuals)

		Male	Female
a)	Heads of Departments/sections	8	1
b)	Senior Clinical Academic Staff (Professors, Associate Professors, Readers, Senior Lecturers or their equivalent [in whole time equivalents])	3	0
c)	Senior Research/Academic Staff (excluding those in a) and b) above)	2	6
d)	All other Clinical Teaching Staff (in whole time equivalents)	12.5	10.5
e)	All other academic/teaching staff (in whole time equivalents)	/	/
f)	All administrative and secretarial staff	0	11 *
g)	All nursing and auxiliary staff	10	46,65
h)	Dental Technical Laboratory staff	/	/
i)	All clinical staff with exclusively service commitments, excluding those listed and who are not involved in academic dentistry	/	/

\* excluding staff for financial administration of treatment fees

### 4.2 Staff listed by sex

	Male	Female
Total number of all staff employed in Dental School	35.5	75.15

### 4.3 Salary budget for staff

Annual total salary budget for all staff of institution (2000) in Euros	4.400.000
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## 4.4 Senior staff

### Heads of Department:

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### Professor

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### Senior Lecturers

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### Staff with specific responsibilities

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#### **4.5 Departments and numbers of whole time clinical academic staff**

		WTE academic staff
1	Dept. of Conservative and Preventive Dentistry	( 7 )
2	Section of Endodontics	( 2 )
3	Dept. of Periodontology	( 3 )
4	Dept. of Pediatric Dentistry	( 4 )
5	Dept. of Preclinical Prosthodontics	( 6 )
6	Dept. of Prosthetic Dentistry	( 8 )
7	Dept. of Orthodontics	( 6 )
8	Dept. of Maxillo-Facial-Surgery	(7,8)
9	Dept. of Oral Surgery	( 6 )
10		( )
11		( )
12		( )

#### **4.6 Approximated ratio of full-time staff to part-time staff in supervision of students' clinical training:**

1 : 0,5

**4.7 Average number of hours per week spent by full time senior clinical academic staff in treating patients:**

13.86

#### **4.8 Specialist and Higher degree training courses.\*\***

Subject/Speciality	Degree Awarded	Length of Course	Annual Output
Postgraduate program in Orthodontics	Specialist*	3	2
Postgraduate program in Oral Surgery	Specialist*	3	1
Postgraduate program in Maxillo-Facial-Surgery	Specialist*	4	1
Advanced education in Prosthodontics	**	3	***
Advanced education in Periodontology	**	3	***
Advanced education in Pediatric dentistry	**	3	***
Advanced education in Endodontics	**	3	***
* Specialist in Orthodontics, Oral Surgery or Maxillo-Facial-Surgery, respectively			
** Dentist with advanced education in Prosthodontics, Periodontology, Pediatric Dentistry or Endodontics, respectively			
*** Programs inaugurated 1/2000, no output rates available yet			

#### **4.9 Number of auxiliaries trained each year**

	Annual Output	Length of course (years)
a) dental nurses	9	2,5 - 3
b) technicians	/	/
c) hygienists	/	/
d) dental therapists	/	/
e) other expanded duty auxiliaries	/	/

### Visitors' Comments

The visitors were told that the clinical workforce is not enough to deliver the agenda that the staff and students consider necessary. It is important that the situation is reviewed in the immediate future and subject to the outcome of this process, appropriate solutions should be determined.

## Section 5: The Biological Sciences

### Visitors' Comments

The teachers of Basic Science all considered that there was a lack of co-ordination between the teaching of individual subjects and between basic and clinical sciences. However the Approbationsordnung prevents flexibility and innovations. National plans to rationalise this are supported and changes should be introduced as soon as possible.

The timetable sometimes disadvantaged dental students because there are two entries to the course each year. The teachers would welcome the formation of a Curriculum Committee or a Review Group, which would improve communications between their disciplines and encourage contacts with other preclinical and clinical colleagues. A thematic approach to the curriculum would assist this process.

### 5.1 Biology

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#### 1. Introduction

In their first semester the students of dental and human medicine visit together the lecture entitled „Biologische Grundlagen der Entwicklung zum Menschen“ [~, „Underlying principles in the evolution to man“]. Originating from self-replicating molecules with encoded information, life is presented as a hierarchy of functional systems of ascending complexity, which developed in a historical process. It is the aim of this lecture to show that all systems of the human body were derived under certain conditions from our ancestors and were developed to solve functional demands, which we are now familiar with and which are of clinical relevance. Students should obtain an orientation based on knowledge of the biological systems, which will help them to establish criteria for making decisions in their ensuing clinical courses and later as physicians.

#### 2. Primary Aims

To gain an understanding of the characteristics of the cell as emergence-phenomenon  
 Evolutionary and physico-chemical constraints of the habitus and organ systems of man

#### 3. Main Objectives

Organization of the cell  
 Eumetazoa; Comparison of hydro-, ecto- and endoskeletons and their related specific adaptations in the different organ systems  
 Evolution as well as primary and secondary functions of the following organ systems, their mutual influence and their common regulation by the nervous system in chordates:  

- Locomotory apparatus, viscero- and neurocranium
- Cardiovascular system
- Respiratory and gastrointestinal systems
- Genitourinary system
- Coelom

 Evolution of the central nervous system and the mental and social abilities, especially in man

#### 4. Hours in the Curriculum

Two hours a week during the first semester  
 In summer semester: 26 hours  
 In winter semester: 32 hours

#### 5. Method of Learning/Teaching

Lecture, questions allowed

#### 6. Assessment Methods

Required attendance;

Examination as a part of the preexamination in natural sciences at the end of the second semester.

## **7. Strengths**

A total view of the biological background of man is presented to the students with the intention that the details presented in subsequent special lectures and courses will more readily be understandable in a broader sense. This view is demonstrated by examples, in which the disturbance in the life of a patient originates on various levels, e.g *biochemical-biophysical level, level of hormonal regulation of organs, level of complex behaviour in social systems* and is treated by specialists of different medical disciplines.

## **8. Weaknesses**

Many students have difficulties with the transition from school to university. The dramatic ascent in learning already after a few weeks into the semester is a challenge for most students. Considering, additionally, the different educational levels of the various schools the students come from, one can imagine the difficulties in establishing a common standard.

To date, the time-table allows the students to take their courses and lectures without overlap. It is extremely important that this situation be maintained, and should be considered as a major aspect for those who are in charge of determining how many students are admitted to study dentistry.

## **9. Innovations and Best Practices**

Construction of the body of vertebrates is explained under consideration of the results of technical sciences.

## **10. Plans for Future Changes**

The staff of the "Institut für Anatomie und Zellbiologie" is too small and the teaching load much too enormous to adequately fulfill all the goals of teaching. In an effort to alleviate the staff of the Anatomy Department, in future members of other pre-clinical institutes will be either taking over the entire lecture or parts thereof. Thus, it remains to be seen whether the present concept will be retained or abolished and a completely new emphasis established.

## **11. Visitors' Comments**

The lecture in the first semester which describes the "Underlying principles in the evolution to man" provides a logical introduction to the rest of the biological and preclinical sciences. It is an example of good practice.

The remainder of the course is well organised and it is interesting that the discipline is taught by the Department of Anatomy.

## **5.2 Chemistry**

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### **1. Introduction**

The course of chemistry consists of three components: a seminar, the practical lab course and written tests. The seminar, where students acquire the theoretical basics for the lab-course, is held for all groups together. All important themes of chemistry concerning the physiology of the human body are covered here. The lab course consists of six days of anorganic and six days of organic chemistry. The course is held for small groups of max. 16 students who are supervised by one instructor. Students have to attend at least 11 of 12 course days. At the beginning of the course the students get a booklet which explains the theory as well as the experiments the students have

to do. It is expected that the students are prepared for the experiments when they come into the lab. In the lab, the experiments take approximately half the time, while the other half is spent discussing the theoretical basics for the experiments. The students write a protocol for every step of the experiments, which the instructor controls. During the course four written tests are given, where questions concerning the experiments and the theory are asked. Each test takes 30 minutes, and a maximum of 10 points can be achieved.

## **2. Primary Aims**

To demonstrate and practice the most important chemical lab work, which is important for further medical studies, both theoretically and practically. This course should help students understand the basic methodology, since the profound knowledge of chemistry is the basis for the later understanding of lab results. The students also acquire the basic knowledge of chemistry for a better understanding of biochemistry, physiology and Internal Medicine, which they will have later on.

## **3. Main Objectives**

- acids and bases, titration, salts and buffer
- redox reaction, electrochemistry
- qualitative analysis, complexes
- nomenclature and stereochemistry of organic molecules, classification of elements
- qualitative analysis of organic compounds
- kinetics of reactions
- natural elements, polymeric elements

## **4. Hours in the Curriculum**

The course takes place in the second semester. The lab course takes place 12 times, 4,5 hours each (= 54 hours per semester). The seminar also takes place 12 times, 1,5 hours each (= 18 hours per semester).

## **5. Method of Learning/ Teaching**

The themes are selected by a professor and are taught in a lecture with overhead-projector, blackboard and handouts. During the practical part of the lab course, the students are instructed in the correct way of handling chemicals and instruments. During the whole course the students are supervised by their instructor, whom they can always ask questions.

## **6. Assessment Methods**

The course goal is achieved if at least 11 of 12 days have been attended successfully and enough points have been reached in the written tests.

## **7. Strengths**

The students learn to do the experiments on their own responsibility, they record all their observations, discuss and understand them.

## **8. Weaknesses**

Since the course takes place at the beginning of their studies, the students can not see the importance and relevance in relation to their later work.

## **10. Plans for Future Changes**

Better motivation of students by relating the course directly to medical questions.

## **5.3 Physics**

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## 1. Introduction

This course (3 hours lectures in the first and second semester, 2.5 hours laboratory work in the first semester) is designed to provide a basic level of knowledge of physics, the most fundamental of all natural sciences. The following topics are covered: mechanics, thermodynamics, electricity and magnetism, optics as well as an introduction to modern physics (structure of matter, atomic, nuclear physics). In addition, the course presents applications of physics in technology, life sciences and medicine. The lectures include a large number of demonstration experiments as well as multimedia presentations and interactive computer simulations.

## 2. Primary Aims

Provide essential knowledge of basic physics. Enable students to understand the application of physical concepts in medical disciplines.

## 3. Main Objectives

Understanding the basic principles governing the physical world

Understanding of experimental methods in physics

Practical experience in experimental physics via laboratory experiments in

- mechanics
- thermodynamics
- electricity and magnetism, optics
- atomic and nuclear physics

Understanding applications of physics in chemistry, biology and medical science

Introduction to the physics of ionizing radiation and radiation protection

Training in scientific reasoning

## 4. Hours in the Curriculum

3 hours lectures per week in the first two (preclinical) semesters, 2.5 hours of laboratory work in the first or second semester

## 5. Method of Learning/Teaching

During the lectures, topics are presented by various methods, including chalk/blackboard, transparencies and multimedia presentations. Each lecture includes several demonstration experiments and/or interactive computer simulations. Laboratory work is done under close supervision and guidance of experienced graduate students in physics. There are problems with solutions as well as interactive experiment simulations available via the internet.

## 6. Assessment Methods

Written exams for the laboratory work, oral exam after the second semester.

## 7. Strengths

Demonstration experiments and practical experience illustrate concepts of physics.

## 8. Weaknesses

Laboratory experiments rely partly on physics discussed in the lectures of the second semester. It would be desirable to schedule the laboratory work in the second semester, which is not always possible due to constraints from non-physics courses.

## 10. Plans for Future Changes

Availability of lectures and simulations as multimedia presentations available via internet

## 5.4 Terminology

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### 1. Introduction

The students of dentistry are integrated in the course provided for the students of human medicine. Only students of dentistry without a school degree of Latin language have to attend this course being held in the first semester. Divided into three parallel groups and, furthermore, the differentiation in plenum and smaller groups assisted by tutors, this course gives the opportunity for a maximum of intensified learning. The intention of teaching is to make the students familiar with medical vocabulary and nomenclature and to enable them to recognize the context of word-formation and -morphology.

### 2. Primary Aims

- Basic grammatical skills in Latin
- Basic knowledge of terminology and medical humanities

### 3. Main Objectives

- Basic vocabulary (Latin and Greek), ability to construct and deconstruct complex terms
- Use of medical vocabulary (practical exercises on the skeleton and seminar papers on organic systems)

### 4. Hours in the Curriculum

2 hrs. / week

### 5. Method of Learning/ Teaching

Lectures, exercises and discussions (in small groups)

### 6. Assessment Methods

Written examination

### 7. Strengths

In so far as historical tradition is language inherent, medical terminology has to do a lot with medical history – the terms represent medical theories as well as standards of knowledge in times past by. So it is very important to focus on this context as well in order to really understand medical terminology. To achieve this the plenum meeting also includes short reviews of history of medical theories about health and illness, the history of special disciplines i.e. anatomy, physiology, surgery and the conditions of healing in past times in order to become aware of possibilities and limitations at present as well.

### 8. Weaknesses

The course, that students of dentistry participate in, is in fact limited to Friday late afternoon (4.30 – 6.00 p.m.), a most uncomfortable time. It cuts down motivation of learning and attempts should be made for improvement.

### 9. Innovations and Best Practices

Teaching in small groups in parallel meetings assisted by tutors (students of human medicine) to achieve an utmost effective learning.

## **10. Plans for Future Changes**

In order to lay more emphasis on the specific terminological problems of dentistry and thus increase their motivation, a separate, specific course for dental students would be ideal. This, of course, would result in considerable organizational consequences including the preparation of special teaching material and final written examinations. Alternatively this could be reached by the planned revision of existing material, laying more emphasis on the important issues for the students of dentistry.

## **11. Visitors' Comments**

The teaching of Terminology is interesting especially the plenary group, which examines the history of disease and treatment and extends the philosophy to the present. These groups might provide an opportunity to introduce students to the principles of ethics. IT requires a clear understanding of a common terminology, this course is a good introduction to these aspects.

## **5.5 Biochemistry**

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### **1. Introduction**

We teach all aspects of modern biochemistry and molecular medicine for medical students as well as dental students in the same lectures, lab courses and seminars.

### **2., 3. Primary Aims and Main Objectives**

Education in basic biochemistry, cell biology and molecular biology, normally in the fourth or fifth preclinical semester, in order to provide a sound background in all aspects of medically oriented biochemistry.

### **4. Hours in the Curriculum**

The biochemistry lectures include Introduction to Biochemistry, two hours a week for one semester, and Basic Biochemistry, four hours a week for one semester.

Seminars in biochemistry, which are optional for dental students, are held four hours a week for one semester.

The lab course in biochemistry comprises 16 four-hour units.

### **5. Methods of Learning/Teaching**

Lectures deal with the following topics:

- Amino acids and carbohydrates
- Proteins (characterization, structure and function)
- Enzymes and coenzymes, vitamins
- Nucleic acids (metabolism and function, transcription and translation)
- Lipids and lipid metabolism
- Biological oxidation, electron transport and oxidative phosphorylation
- Immunology, vascular biology

In the seminars students present oral reports on subjects covered in the biochemistry lectures, using different modern teaching media.

In the lab courses students perform and evaluate experiments dealing with the following topics:

- Quantitative determination of pyruvate and glucose
- Titration curves of amino acids
- Molecular mass determination by gel permeation-chromatography

- Albumin-globulin content in serum
- pH-solubility profile of a protein
- Kinetic studies on serum cholinesterase
- Determination of blood groups by polymerase chain reaction (PCR)
- Lipid-metabolism
- Inhibition kinetics of succinate dehydrogenase from mitochondria
- Mechanism of the synthesis of urea in liver
- Glucose-tolerance test
- Quantitative determination of inorganic phosphate and acetoacetate in urine
- Electrophoretic analysis of isoenzymes of lactate dehydrogenase
- Quantitative determination of L-ascorbic acid

## **6. Assessment Methods**

As a prerequisite for participation in each group of experiments in the lab course, students must submit written answers to questions in the lab manual concerning the basic principles involved. Young tutors assist staff personnel in supervising all students during the experiments and discuss results and perspectives.

Progress in the lab course is controlled by two written multiple choice exams in the middle and at the end of the semester. Each test comprises 26 questions, 50% of which must be answered correctly in one hour.

After the fifth semester students take the oral German Medical Licensing Examination, Step I ("Zahnärztliche Vorprüfung") which includes biochemistry.

## **7. Strengths**

No difference is made between medical and dental students in the quantity and content of lectures, lab courses and examinations.

## **8. Weaknesses**

Due to time constraints the seminars in biochemistry must be optional for dental students. Additional assessment methods would strengthen the discipline.

## **9. Innovations and Best Practices**

Modern topics of biochemistry and molecular medicine are included in the lectures and practical courses.

## **10. Plans for Future Changes**

Multi-media learning and virtual practical experiments will be included in the curriculum.

## **5.6 Physiology**

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### **1. Introduction**

The main lecture in physiology and the practical course in parallel are given for dental students together with medical students during the 4<sup>th</sup> and the 5<sup>th</sup> term. A final seminar is open for dental students but is not obligatory.

### **2.- 3. Primary Aims and Main Objectives**

Main themes of the lecture in the summer term are heart, circulation, respiration, gastransport, acid-base balance, kidney, regulation of body fluid composition and volume.

Experiments of the practical course in the summer term are dealing with heart, central and reflex control of the cardiovascular system, control of peripheral blood flow, electrocardiogramme, blood, respiration, kidney.

Main themes of the lecture in the winter term include general features of excitation and conduction in the nervous system, synaptic transmission, muscle contraction, central nervous system, the senses.

Experiments of the practical course in the winter term are dealing with measurements of metabolism during rest and activity, muscle contraction, conduction of action potentials in peripheral nerve, spinal reflexes, electroencephalogramme, evoked potentials, experiments dealing with the vestibular apparatus, hearing and vision.

#### **4. Hours in the Curriculum**

The lectures are 4 hours per week. The practical course includes seven sessions per semester, each session lasting 4 hours.

#### **5. Method of Learning/ Teaching**

Lectures and practical courses

#### **6. Assessment Methods**

Written examination (multiple choice) at the end of each semester

#### **7. Strengths**

none

#### **8. Weaknesses**

none

#### **9. Innovations and Best Practices**

none

#### **10. Plans for Future Changes**

none

## Section 6: Pre-Clinical Sciences

### 6.1 Anatomy

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#### 1. of 6 „*Anatomy I; Locomotory apparatus*“

##### 1. Introduction

In their first semester the students of dental and human medicine visit together the lecture entitled „Anatomie I, Bewegungsapparat“ [~ „*Anatomy I; Locomotory apparatus*“]. The previous experiences of students in the area of sports, both active and passive, are the selected starting point, from which the various components and aspects of the locomotory apparatus are explained according to structure and function for habitus and movement and their influence on other systems e.g. cardiovascular system, respiratory system.

##### 2. Primary Aims

Although the main stress in the first semester is on the natural sciences, students are offered an overview of the locomotory apparatus, thereby preparing the way for a more detailed study in the realm of the gross Anatomy course in the subsequent semester.

##### 3. Main Objectives

The skeletal apparatus including muscles and joints  
 The trunk (analysis of static, movement and habitus)  
 The shoulder girdle, the hip and the extremities (Comparison of structure and function)  
 Analysis of energy costs of different types of movement

##### 4. Hours in the Curriculum

Two hours a week during the first semester  
 In summer-semester: 26 hours  
 In winter-semester: 32 hours

##### 5. Method of Learning/Teaching

Lecture, exercise of the own range of movement, patients with restricted range of movement, videos, questions allowed

##### 6. Assessment Methods

Required attendance;  
 Examination as a part of the dental preexamination after the fifth semester.

##### 7. Strengths

The differentiated overview helps the students to learn the relation between own daily experiences and the physical and physiological theory of the locomotory apparatus. It is used as an example to explain the scientific attitude.

Additionally, dissected trunks and limbs with their musculature, their articulations and ligaments of human corpses are demonstrated in small groups in accordance to the topics presented in the lectures (Assessment not required). During the demonstrations students have the possibility to ask questions, to touch and understand the different parts of the locomotor apparatus and the supplying vasculature and innervation. Thereby the students slowly gain access to dissected parts of the human body, before they are confronted with the undissected cadaver in their own dissection course in one of the following semesters.

## **8. Weaknesses**

Many students have difficulties with the transition from school to university. The dramatic ascent in learning already after a few weeks into the semester is a challenge for most students. Considering, additionally, the different educational levels of the various schools the students come from, one can imagine the difficulties in establishing a common standard.

To date the time-table allows the students to take their courses and lectures without overlap. It is extremely important that this situation be maintained, and should be considered as a major aspect for those who are in charge of determining how many students are admitted to study dentistry.

## **9. Innovations and Best Practices**

Use of computer simulations, videos, and films presenting clinical investigations, which allow visualization of the locomotory apparatus in action.

## **10. Plans for Future Changes**

Extending the present concept of this lecture; additional video material.

## **2. of 6 „*Anatomy I; Organ Systems of Man*“**

### **1. Introduction**

In their first semester the students of dental and human medicine visit together the lecture entitled „Anatomie I, Organsysteme des Menschen“ [~ „*Anatomy I; Organ Systems of Man*“]. The tissues and the organ systems are presented with respect to structure, topography, function and embryologic aspects.

### **2. Primary Aims**

Although the main stress in the first semester is on the natural sciences, students are offered an overview on organ systems, thereby preparing the way for a more detailed study in the realm of the gross Anatomy course in the subsequent semester.

### **3. Main Objectives**

- Cell and tissues
- Blood, lymph- and cardiovascular system
- Respiratory and gastro-intestinal systems
- Genito-urinary system
- Head
- Autonomic nervous system

### **4. Hours in the Curriculum**

Two hours a week during the first semester  
 In summer-semester: 26 hours  
 In winter-semester: 32 hours

### **5. Method of Learning/Teaching**

Lecture, questions allowed

### **6. Assessment Methods**

Required attendance;  
 Examination as a part of the dental preexamination after the fifth semester.

## 7. Strengths

The differentiated overview helps the students to recognize the fundamental connections to the natural sciences and thus motivates learning.

Additionally, dissected cadavers with the organs in proper topographical position are demonstrated in small groups in accordance with the topics presented in the lectures (Assessment not required). During the demonstrations students have the possibility to ask questions, to touch and understand the form and topographic position of the organs and the supplying vasculature and innervation. Thereby, the students slowly gain access to dissected parts of the human body, before they are confronted with the undissected cadaver in their own dissection course in one of the following semesters.

## 8. Weaknesses

Many students have difficulties with the transition from school to university. The dramatic ascent in learning already after a few weeks into the semester is a challenge for most students. Considering, additionally, the different educational levels of the various schools the students come from, one can imagine the difficulties in establishing a common standard.

To date the time-table allows the students to take their courses and lectures without overlap. It is extremely important that this situation be maintained, and should be considered as a major aspect for those who are in charge of determining how many students are admitted to study dentistry.

## 9. Innovations and Best Practices

Use of computer, videos, and films presenting clinical investigations, which allow visualization of the organs and their function.

## 10. Plans for Future Changes

Extending the present concept of this lecture; additional video material

## **3. of 6 „*Systematic and topographical anatomy as well as developmental history of the organ systems*“**

### 1. Introduction

In their third or fourth semester, depending on their admittance to the study of dentistry, the students of dental and human medicine participate together in the same lecture entitled „Systematische und Topographische Anatomie sowie Entwicklungsgeschichte der Organsysteme“ [~ „*Systematic and topographical anatomy as well as developmental history of the organ systems*“]. This lecture presents the topics parallel to the dissection course.

### 2. Primary Aims

Specific and differentiated anatomical information about the organ systems and the fetal development of the human body is presented. The mutual influence of the organ systems and their control is emphasized.

### 3. Main Objectives

- Skin
- Subcutis
- Muscles
- Vessels
- Nerves
- Viscera
- Head
- Neck

### 4. Hours in the Curriculum

The lecture is carried out only during the winter semester

Five hours a week during the third or fourth semester = 90 hours

## **5. Method of Learning/Teaching**

Lecture, developing of overhead acetates, videos and film spots. Discussions and questions.

## **6. Assessment Methods**

Required attendance.

Examination as a part of the dental preexamination after the fifth semester.

## **7. Strengths**

Students receive a very broad theoretical view of topics encountered in the dissection course. Practical experience and theoretical explanations help the students to achieve a broader insight into the physical aspects of man.

## **8. Weaknesses**

According to the time-table there is a time lag between the lecture given each day in the early morning and the beginning of the dissecting course.

## **9. Innovations and Best Practices**

none

## **10. Plans for Future Changes**

As a prerequisite for medical studies this lecture will be set forth.

## **4. of 6 „Anatomical dissection exercises for dental students“**

### **1. Introduction**

In their third or fourth semester, depending on their admittance to the study of dentistry, the students of dental and human medicine participate together in the same dissection course entitled „Anatomische Präparierübungen für Zahnmediziner“ [~ „Anatomical dissection exercises for dental students“] or „Kursus der Makroskopischen Anatomie“ [~ „Course of macroscopical anatomy“].

### **2. Primary Aims**

Gaining specific and differentiated anatomical knowledge of the human body by dissecting a cadaver. Dental students are only obliged to achieve an overview of the limbs. The functional anatomy and fundamentals of embryology are emphasized.

### **3. Main Objectives**

Skin,  
Subcutis,  
Muscles  
Vessels  
Nerves  
Viscera  
Head  
Neck

### **4. Hours in the Curriculum**

The course is only held during the winter semester.

Eight hours a week during the third or fourth semester = 128 hours

## **5. Method of Learning/ Teaching**

Dissection of the head and the neck for the dental students.  
Demonstration of the remainder of the dissected structures. Discussions and questions.

## **6. Assessment Methods**

Required attendance,  
Students have to pass four oral tests by different faculty members.  
 a) Osteology including ligaments  
 b) Abdominal wall and back, for dental students limbs only in a very general overview  
 c) Head and neck  
 d) Situs and retrostitus including thoracic, abdominal and pelvic organs  
Examination as a part of the dental preexamination after the fifth semester.

## **7. Strengths**

Students can start an intensive two week self-study immediately before the start of the semester.  
14 students ( 2 are dental students) as a group dissect a cadaver. Each group is supervised by a faculty member, who is responsible for two groups, and a student tutor for each group.  
Students have additional access to dissected material outside of course-time. The student tutor is present for extra two hours.  
During the course students get help in dissection and answers to their questions.

## **8. Weaknesses**

In addition to this time-consuming course with an intensive learning load the students take other courses with a nearly similar strain of learning during the same semester.

## **9. Innovations and Best Practices**

none

## **10. Plans for Future Changes**

As a prerequisite for the study of dentistry this course will be continued.

## **5. of 6 „Anatomy III, Anatomy of the nervous system and of the sense organs“**

### **1. Introduction**

In their third or fourth semester, depending on their admittance to study dentistry, the students of dental and human medicine participate together in the same lecture entitled „Anatomie III, Anatomie des Nervensystems und der Sinnesorgane“ [~ „Anatomy III, Anatomy of the nervous system and of the sense organs“ ]. This lecture presents the topics parallel to the course „Teil ,NERVENSYSTEM UND SINNESORGANE‘ der Anatomischen Präparierübungen für Zahnmediziner“ [~ „Part ,NERVOUS SYSTEM AND SENSE ORGANS‘ of the Anatomical dissecting exercises for dental students“ ].

### **2. Primary Aims**

Specific and differentiated macroscopic and microscopic anatomical information as well as fetal development of the nervous system and the sense organs as well as of their meninges, vessels, blood-brain- and blood-liquor-barrier are presented. The multiplicity of mental processes, which are bound to the nervous system, is emphasized.

### **3. Main Objectives**

Spinal cord and spinal nerves  
Brain; its parts, nuclei, main tracts, functional centers and cranial nerves  
Meninges of brain and spinal cord  
Reflexes and sensomotoric circuits, principles of sensory-motoric systems

Autonomic part of peripheral nervous system

#### **4. Hours in the Curriculum**

The lecture is carried out only during the summer semester.

Three hours a week during the third or fourth semester = 39 hours

#### **5. Method of Learning/Teaching**

Lecture, use of overhead acetates, videos and film spots. Discussions and questions.

#### **6. Assessment Methods**

Required attendance.

Examination as a part of the dental preexamination after the fifth semester.

#### **7. Strengths**

Students get a very broad theoretical information of the topics they encounter in their course „*NERVOUS SYSTEM AND SENSE ORGANS*“. Theoretical explanation and practical experience help the students to achieve a broader insight into this complex organ system.

#### **8. Weaknesses**

none

#### **9. Innovations and Best Practices**

The lecture in the described form is an innovation.

#### **10. Plans for Future Changes**

As a prerequisite for the study of dentistry this lecture will be continued.

### **6. of 6 Part „*NERVOUS SYSTEM AND SENSE ORGANS*“ of the Anatomical dissecting exercises for dental students**

#### **1. Introduction**

In their third or fourth semester, depending on their admittance to study dentistry, the students of dental and human medicine participate together in the same course entitled „Teil „*NERVENSYSTEM UND SINNESORGANE*“ der Anatomischen Präparierübungen für Zahnmediziner“ [~ „*Part „NERVOUS SYSTEM AND SENSE ORGANS“ of the Anatomical dissecting exercises for dental students*“] or „*Kursus der Makroskopischen Anatomie*“ [~ „*Course of macroscopical anatomy*“].

#### **2. Primary Aims**

To gain specific and differentiated knowledge of the macroscopic and microscopic anatomy and fetal development of the nervous system and the sense organs as well as their meninges, vessels, blood-brain- and blood-liquor-barrier. The multiplicity of mental processes, which is bound to the nervous system, is emphasized.

#### **3. Main Objectives**

Spinal cord and spinal nerves

Brain; its parts, nuclei, main tracts, functional centers and cranial nerves

Meninges of brain and spinal cord

Reflexes and sensomotoric circuits, principles of sensory-motor systems

Autonomic part of peripheral nervous system

#### **4. Hours in the Curriculum**

The course is carried out only during the summer semester.  
Two hours a week during the the third or fourth semester = 26 hours

#### **5. Method of Learning/Teaching**

Demonstrations of dissected brain and spinal cord by a faculty member. Brain slices according to the methods of pathologists are demonstrated. Discussions and questions.

#### **6. Assessment Methods**

Required attendance,  
Students must pass one oral test by the faculty member, who was responsible for the group throughout the entire semester.

Examination as a part of the dental preexamination after the fifth semester.

#### **7. Strengths**

14 students ( 2 are dental students) form a group. Two groups are supervised by a faculty member and a student tutor. A course script is offered to the students as a guide for recognizing the fundamentals in the overwhelming amount of knowledge in the special aspects of the nervous system. Students have additional access to the material outside of course-time. During the course students receive demonstrations about various topics and answers to their questions.

#### **8. Weaknesses**

It is desirable to have more material for dissection.

#### **9. Innovations and Best Practices**

The course in the form described above is an innovation.

#### **10. Plans for Future Changes**

As a prerequisite for the study of dentistry this course will be continued in this form.

## **6.2 Histology**

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### **1. of 2 „*Anatomy II (cytology, histology, and microscopic anatomy of the organs)*“**

#### **1. Introduction**

In their third or fourth semester, depending on their admittance to study of dentistry, the students of dental and human medicine participate together in the same lecture entitled „Anatomie II (Zytologie, Histologie und Mikroskopische Anatomie der Organe)“ [~ „*Anatomy II (cytology, histology, and microscopic anatomy of the organs)*“]. This lecture presents the topics parallel to the „Microscopic-anatomical course for dental students“.

#### **2. Primary Aims**

Specific and differentiated anatomical information on the cytology, histology and microscopic anatomy of the organ systems of the human body is presented. The nervous and hormonal control of the organ systems is emphasized.

### **3. Main Objectives**

The cell (structure, ultrastructure and functions)  
 Tissues (structure, ultrastructure and functions)  
 Cytological and histological techniques  
 Organs  
 Differential diagnosis  
 Diagnosis

### **4. Hours in the Curriculum**

The lecture is carried out only during the summer semester.  
 Four hours a week during the third or fourth semester = 52 hours

### **5. Method of Learning/Teaching**

Lecture, use of overhead acetates, videos and film spots. Discussions and questions.

### **6. Assessment Methods**

Required attendance.  
 Examination as a part of the dental preexamination after the fifth semester.

### **7. Strengths**

Students receive very broad anatomic and functional information on the topics that they encounter in their „Microscopic-anatomical course“. Applying the theoretical explanation to the microscopically viewed specimen, the students achieve a deeper insight into the microscopic level of the physical aspects of man and gain security in differential diagnoses.

### **8. Weaknesses**

none

### **9. Innovations and Best Practices**

At the end of the semester there is a discussion concerning the lecture and the course.

### **10. Plans for Future Changes**

As a prerequisite for the study of dentistry this lecture will be continued.

## **2. of 2 „Microscopic-anatomical course for dental students“**

### **1. Introduction**

In their third or fourth semester, depending on their admittance to study dentistry, the students of dental and human medicine participate together in the same course entitled „Mikroskopisch-anatomischer Kursus für Zahnmediziner“ [~ „Microscopic-anatomical course for dental students“] respectively „Kursus der Mikroskopischen Anatomie“ [~ „Course of microscopic anatomy“].

### **2. Primary Aims**

Gaining specific and differentiated anatomical knowledge in the cytology, histology and microscopic anatomy of man.

### **3. Main Objectives**

The cell (structure, ultrastructure and functions)  
 Tissues (structure, ultrastructure and functions)  
 Cytological and histological techniques  
 Organs

Differential diagnosis  
Diagnosis

#### **4. Hours in the Curriculum**

The course is carried out only during the summer semester.  
Six hours a week during the third or fourth semester = 78 hours

#### **5. Method of Learning/Teaching**

Cytology is viewed from ultrastructural atlas and special photos. Specimens of mostly human tissues and organs are investigated with the microscope.

#### **6. Assessment Methods**

Required attendance,  
Students have to pass two oral tests by different faculty members.  
a) Diagnostics of histological and cytological specimens  
b) Diagnostics of organs, organ systems and their function

Examination as a part of the dental preexamination after the fifth semester.

#### **7. Strengths**

During the entire course time the students are guided by faculty members and tutors, their individual questions being answered and receiving help with the microscope. Specimens of topics being explained are projected by a central modern projection microscope. Each student works with a very modern binocular microscope with equivalent specimens that are centrally demonstrated by the faculty members via the projection microscope. Students have additional access to microscopes and specimens outside the course-time.

#### **8. Weaknesses**

Outside the course-time, no tutors are available to help the students with their self-study.

#### **9. Innovations and Best Practices**

The above-mentioned test-form has just been introduced.

#### **10. Plans for Future Changes**

As a prerequisite for the study of dentistry this course will be continued.

### **6.3 Embryology**

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#### **1. Introduction**

In their third or fourth semester, depending on their admittance to the study of dentistry, the students of dental and human medicine visit together the lecture entitled „Embryologie“ [~ „Embryology“]. Starting from the principles of the production of the parenteral germ cells detailed information is given on fertilization, cleavage and embryonic development (Fetal development excluded! See 6.1 Anatomy; 3 of 6; 5 of 6). Clinical signs of full development at birth are given.

#### **2. Primary Aims**

To gain a broader understanding of complex human embryologic development consideration is made of phylogenetic pertinent heritage.

### **3. Main Objectives**

Germ cell production  
Fertilization  
Yolk distribution and cleavage  
Embryonic-maternal dialogue  
Germ layers and embryonic development  
Clinical signs of full development at birth

### **4. Hours in the Curriculum**

The lecture is carried out only during the summer semester.  
Two hours a week during the third or fourth semester = 26 hours

### **5. Method of Learning/Teaching**

Lecture, questions allowed

### **6. Assessment Methods**

Required attendance;  
Examination as a part of the preexamination in natural sciences at the end of the second semester.

### **7. Strengths**

Under considerations of cell-cell interactions and of evolutionary facts the details of embryonic and fetal development as well as the occurrence of malformations are more readily comprehensible.

### **8. Weaknesses**

Generally many dental students are only interested in those embryologic facts concerning the development of the maxillo-mandibular apparatus.

### **9. Innovations and Best Practices**

Special mechanisms of fertilization including modern reproductive medicine.

### **10. Plans for Future Changes**

As a prerequisite for the study of dentistry this lecture will be continued.

### **11. Visitors' Comments**

The Institute of Anatomy has good facilities and equipment and dental students are well integrated with their medical colleagues. They study all of the body except the leg with a special emphasis on head and neck.

Anatomy is used in a functional way to introduce students to most of the medical specialties, which is innovative and especially useful to future dentists.

To complement the usual teaching methods student may use CAL programmes.

The anatomy department would welcome any attempt to consider the overall curriculum and timetable and are eager to join any curriculum review process. Their interest is demonstrated by their concern about the clinical facilities for student available in the dental school.

## Section 7: Para-Clinical Sciences

### Visitors' Comments

- In common with their Basic Sciences colleagues the teachers of Para Clinical Sciences all considered that there was a lack of co-ordination between the teaching of individual subjects as well as a lack of integration with clinical dentistry. They too would welcome the formation of a Curriculum Committee or a Review Group, which would improve communications between their disciplines and with clinical dentistry and encourage contacts with other preclinical and clinical colleagues. A thematic approach would assist this process.  
Some collaboration with clinical dentistry (in particular with Periodontology and Paediatric Dentistry) already exists and should be further encouraged.

### 7.1 Pharmacology

Name of course: Pharmacology for Dentists

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#### 1. Introduction

Pharmacology and toxicology are the scientific basis of pharmacotherapy. The course provides the students with the knowledge of drug treatment in dentistry, as well as of common diseases. Drug treatment of patients can have a considerable impact on the safety of dental treatment. Since dentists are allowed to prescribe drugs that have no direct relation to dentistry their pharmacological knowledge must cover the drugs of common diseases.

The course is taught at the end of the curriculum (8./9.Semester) during one year.

#### 2. Primary Aims

Understanding of the relevant concepts of general and clinical pharmacology with specific emphasis on dental practice.

#### 3. Main Objectives

- Pharmacokinetics/ pharmacodynamics	3 x 90 min
- Local anesthetics	2 x 90 min
- Analgesics/ anti-inflammatory drugs	3 x 90 min
- Antibiotics	3 x 90 min
- Drug treatment in emergency medicine	2 x 90 min
- Drug prescription	1 x 90 min
- Drugs during pregnancy and lactation period	1 x 90 min
- Drug treatment of the cardiovascular diseases	2 x 90 min
- Drugs affecting coagulation and the hemostatic system	1 x 90 min
- Drug treatment of the autonomic nervous system and CNS disorders	4 x 90 min
- Drug treatment of endocrine disorders	1 x 90 min
- Treatment of intoxications	1 x 90 min
- Drug development	1 x 90 min

#### 4. Hours in the Curriculum

25 x 90 minutes during 1 year (2 semesters)

## **5. Method of Learning/Teaching**

Lectures

## **6. Assessment Methods**

No assessment during the course,  
but an oral examination during the final examination at the end of the curriculum.

## **7. Strengths**

Systematic lectures

## **8. Weaknesses**

- Lack of time for the students to attend the lectures
- Poor transfer of evidence based medicine which is imparted by the lectures into the "practical dentistry"
- Poor coordination with other courses

## **9. Innovations and Best Practices**

Hand-outs at the beginning of each lecture

## **10. Plans for Future Changes**

Improvement of point 8.

## **11. Visitors' Comments**

- The active selection of topics for the course was exemplary and appropriate for dentistry.
- The timing in the curriculum was suitable and allows students to implement their knowledge in clinical situations immediately. However delivering the lectures late in the day does not encourage students to attend.
- Efforts are made to relate the teaching of antibiotic therapy to microbiology.
- There are some differences between the recommendations made by teachers for drug prescriptions.

## **7.2 Microbiology**

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### **1. Introduction**

The course is placed at the beginning of the 8<sup>th</sup> or 9<sup>th</sup> term respectively.

### **2. Primary Aims**

Providing the knowledge of the properties of microorganisms and their role in host-parasite interactions.

### **3. Main Objectives**

Structure of microorganisms, taxonomy and identification methods; normal flora, especially of the oral cavity; basics of immunology, host defense; well defined topics from bacteriology and virology of general importance and features of special interest to dental students; chemotherapy and resistance problems.

#### **4. Hours in the Curriculum**

The whole lectures are given during one week with a total of 30 lessons.

#### **5. Method of Learning/Teaching**

Lectures only, no practical training.

#### **6. Assessment Methods**

Examination as part of the dental state board exam after the 10<sup>th</sup> semester.

#### **7. Strengths**

Lectures in a small group of students offer the opportunity of interactive teaching; there are no problems in discussing matters of special interest in more depth.

#### **8. Weaknesses**

Students of dental medicine are not so familiar with microbiological problems, therefore, there is not sufficient time to get a deeper understanding of the general perspectives of infectious diseases.

#### **9. Innovations and Best Practices**

none

#### **10. Plans for Future Changes**

To link topics of this course closer to the clinical sciences, e. g. special infectious diseases to Internal Medicine, Dermatology or General Surgery, and the basics of chemotherapy to Pharmacology.

#### **11. Visitors' Comments**

Time for reflections and self-study is included in the course.

In addition to plans already proposed the visitors recommend better integration with the dental clinical sciences.

### **7.3 Pathology**

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#### **1. Introduction**

The course is held for dental students in the 3<sup>rd</sup> or 4<sup>th</sup> year and consists of lectures and a practical histopathological course.

#### **2. Primary Aims**

To understand the basics of general and systematic pathology as well as of histopathology; to practice microscopy and diagnostical tissue analysis.

### **3. Main Objectives**

#### **Lecture: General and Systematic Pathology for Dental Students**

- The role of pathology in the understanding of diseases
- Inflammatory diseases
- Non-neoplastic lesions
- Risk-factors, etiology, pathogenesis, and classification of preneoplastic and neoplastic diseases, especially of the head and neck area
- Screening of oral cavity cancer

#### **Course: Histopathology for Dental students**

- General aspects of diagnostical tissue analysis and microscopy
- Inflammatory diseases
- Neoplasms
- Non-neoplastic diseases
- Special non-neoplastic diseases of the head and neck area
- Neoplastic diseases of the head and neck area

### **4. Hours in the Curriculum**

Lecture: 12 hours per semester

Course: 24 hours per semester

### **5. Method of Learning/Teaching**

A lecture is held once a week, where the basics of pathology are taught. In the course, which also takes place once a week for 2 hours, each student works at a microscope to be able to look at tissue samples. The tutor himself also works at a microscope and through a camera points out specifics for diagnostical tissue analysis, which each student should then try to find in his own sample.

### **6. Assessment Methods**

At the end of the semester a written test is given.

### **7. Strengths**

Practical work with the microscope.

A separate course for dental students, so that the emphasis can be put on diseases especially of the head and neck area.

### **8. Weaknesses**

Due to the tight dental curriculum, the lecture takes place in the late Friday afternoon and the course on Tuesday evening, which sometimes causes a lack of concentration of the students.

### **9. Innovations and Best Practices**

none

### **10. Plans for Future Changes**

None

### **11. Visitors' Comments**

The main objective, that the dental students should develop competence to screen the oral cavity for tumours, was commendable.

Better integration with the clinical activities would strengthen the course and give the students a better possibility to develop that competence.

## 7.4 Hygienics

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### 1. Introduction

The course is placed in the 7th semester. Lectures: 1 hour per week

### 2. Primary Aims

The primary aims are to teach hygiene as preventive medicine, i.e. the prevention of infectious diseases and non-transmittable diseases (e.g. due to environmental and life style factors) as well as clinical environmental medicine.

### 3. Main Objectives

Topics: Sterilisation, disinfection, vaccination, food hygiene, environmental hygiene (drinking water, bathing water, sewage, garbage, air hygiene), clinical environmental medicine, toxicology of amalgam

### 4. Hours in the Curriculum

One hour per week for one semester.

### 5. Method of Learning/ Teaching

Lectures only

### 6. Assessment Methods

Oral Examination as part of the final examinations

### 7. Strengths

A good overview of potential preventable disease factors is given which is not restricted to dental hygiene problems.

### 8. Weaknesses

It is a purely theoretical course. At the time of the course the students have not yet read microbiology. The microbiology course is given in the following two semesters.

### 9. Visitors' Comments

Unfortunately there was no opportunity to meet representatives from this discipline

## 7.5 Clinical Chemical and Physical Examination Techniques

### 7.5.1 Physical Investigations

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#### 1. Introduction

This is the first part of a comprehensive two-part course on clinical investigations for dental students in the 8<sup>th</sup> term. In multiple tutorial groups students are given demonstrations in diagnostic methods in internal medicine and in what way the methods are related to diseases of major interest. Students experience the use of these diagnostic tools while they are performed on the patient by an experienced tutor.

#### 2. Primary Aims

To understand in what way modern diagnostic tools work, to learn how diseases are diagnosed.

#### 3. Main Objectives

Every student passes the following thematic groups:

- abdominal ultrasound
- cardiac catheterization
- hemodialysis
- inspection, percussion, and auscultation of the chest and the heart (with learning software)
- emergency ward
- ecg and echocardiography
- gastrointestinal endoscopy
- nerve conduction measurement

#### 4. Hours in the Curriculum

An introductory lesson is followed by eight courses over one semester (one day per week, 2 hours; equal to 18 hours per semester).

#### 5. Method of Learning/Teaching

A tutor demonstrates the technique to a group of 2-4 students discussing pathophysiology and significance for major internal diseases.

#### 6. Assessment Methods

Attendance certificate for each course and end of semester certification.

#### 7. Strengths

Practical aspect and clinical relevance

#### 8. Weaknesses

Insufficient coordination with overall dental curriculum

#### 9. Innovations and Best Practices

Introduction of learning software, small tutorial groups

#### 10. Plans for Future Changes

none

## 7.5.2. Course of Clinical Chemistry

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### 1. Introduction

This is the second part of a two-part comprehensive course on clinical investigations for dental students in the 8<sup>th</sup> term. It includes theoretical and practical lessons in preanalytical aspects and in clinical chemistry of disorders in hemostasis, red blood cells, organs, and energy metabolism.

### 2. Primary Aims

Basic understanding of quality of laboratory tests carried out for common clinical diseases, which might interfere with dentistry.

### 3. Main Objectives

Introduction: In the first course, general aspects of clinical chemistry, preanalytical themes, quality control, general information on methodology, on evaluation and interpretation of results are discussed.

Reagent Strip Tests: The introduction includes the use of reagent strip tests in a general dentist's practice, for example for detection of a diabetic person with hypoglycemia, or for exclusion of pregnancy prior to radiological irradiation. The practical part contains a glucose test with capillary blood, determination of  $\gamma$ -glutamyltransferase with the aspect of ethanol abuse and risk by hepatitis infection. Finally, a reagent dip test for blood and protein in urine is shown.

Diagnostics of organ damage: In the theoretical part, the general aspects of quality and quantity requirement and example parameters of organ diagnostics are discussed, while classical enzyme activities are measured thereafter.

Hematology: The students are informed on the basics of methodology in hematology and on preanalytical details and result interpretation. The practical part contains blood sampling, determination of hemoglobin concentration as well as red blood cell and leucocyte count.

Hemostasis: The basics of prothrombin time, its clinical interpretation and method dependency on methodology are taught. The students have to carry out the measurement of prothrombin time using plasma of Marcumar-patients.

Interpretation of results: The basic goal of this course is concerned with the problem to use a laboratory value for clinical decisions, for example to discontinue or continue the treatment of the patient. It is shown, that a statistical evaluation of the laboratory value can lead to a guideline to correctly interpret the value.

### 4. Hours in the Curriculum

Two hours per week for six weeks, located directly after the first part of the course, i.e. „Physical investigations for dental students“.

### 5. Method of Learning/Teaching

The courses „introduction“ and „interpretation of results“ are held for all students (25-30 people) in form of a seminar, the courses „reagent strip tests“, „organ diagnosis“, „hemostasis“ and „diagnostic hematology“ are carried out beginning with an introduction (30 minutes) followed by a practical part, where the students test unknown samples for the analytes in question. A closing session follows which includes interpretation of results and a summary.

### 6. Assessment Methods

Presence of students is certified by the tutor of the course.

## **7. Strengths**

A most relevant selection of methods in laboratory medicine, which might interfere with dentistry, is presented. Suggestions of the students as to the relevance of course contents have been continuously acknowledged.

## **8. Weaknesses**

The time of the courses is integrated too tightly into the overall curriculum of the students. This leads to conflicts at the beginning and the end of the courses concerning the presence of the students. In addition, a practical coordination between the Institute of Clinical Chemistry and the department of dentistry concerning contents and goals of the courses does not exist. No qualitative recommendations concerning the contents of the course are given.

## **9. Innovations and Best Practices**

none

## **10. Plans for Future Changes**

The most eminent problems are discussed in „weaknesses“; in addition a control of success of the course and not only the presence of the students should be considered.

## **11. Visitors' Comments**

The selection of the course content is focused on the needs of clinical dentistry.  
Important emphasis is placed on diagnostic principles in terms of sensitivity, specificity and predictive values, which is not taught elsewhere.

## Section 8: Human Diseases

### 8.1 Internal Medicine

#### 1. Introduction and 2. Primary Aims

The course takes place during the 7<sup>th</sup> and 8<sup>th</sup> semester and has the aim to introduce dental students to the basics of internal medicine, particularly to those subjects important for dental treatment.

#### 3. Main Objectives

- Emergency Medicine (pulmonary oedema, unconsciousness of diabetic patients during dental treatment)
- Cardiology (cardiac insufficiency, coronary heart diseases, cardiac arrhythmias)
- Metabolic Anomalies (diabetes mellitus, fatty anomalies)
- Endocrinology (diseases of thyroid and adrenal gland)
- Pneumology (obstructive airway diseases, pneumonia, tuberculosis)
- Nephrology (acute and chronic renal failure, renal hypertension, renal diseases)
- Haematology (anaemia, coagulopathies, leucocyte diseases)
- Gastroenterology (acute and chronic gastritis, hepatitis, acute and chronic pancreatitis, chronic enteritis)

#### 4. Hours in the Curriculum

1 ½ hours per week for two semesters (8-12 times per semester)

#### 5. Method of Learning/ Teaching

Lecture, questions allowed

#### 6. Assessment Methods

Oral exam as part of the final dental examination.

#### 7. Strengths

None

#### 8. Weaknesses

none

#### 9. Innovations and Best Practices

None

#### 10. Visitors' Comments

The range of subjects covered in the course was impressive.

The visitors were grateful that they met the Head of Internal Medicine, who considered that the Coordination between his discipline and Anaesthetics could be improved. At present Emergency Medicine is only taught by lecture and students have no practical experience.

### 8.2 Anaesthesiology

see Section 13 (Oral and Maxillofacial Surgery)

## **8.3 Dermatology**

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### **1. Introduction**

The course „Dermatology for students of dental medicine“ is given in the 1<sup>st</sup> clinical semester.

### **2. Primary Aims**

To teach basic knowledge about the physiology and pathophysiology of the human skin. Included are lectures about the most common skin diseases, in particular those affecting the mucosa of the mouth. Furthermore, the course covers diseases resulting from complications in the treatment of dental diseases, such as an anaphylactic shock or contact dermatitis.

### **3. Main Objectives**

- Infections of the skin by viruses, bacteria and fungi
- sexually transmitted diseases and AIDS
- parasitic infections
- psoriasis and lichen planus
- allergies (immediate and delayed hypersensitivity)
- eczemas
- acne and rosacea
- autoimmune diseases
- bullous dermatoses
- benign and malignant tumors of the skin
- differential diagnosis of diseases of the mucous membranes.

### **4. Hours in the Curriculum**

The course takes one hour and a half, once a week

### **5. Method of Learning/Teaching**

Lectures with presentation of patients.

### **6. Assessment Methods**

The students have to demonstrate and discuss pathological findings when patients are presented.

### **7. Strengths**

It is a systematic lecture series, teaching the main objectives of dermatology especially for clinical practice.

### **8. Weaknesses**

The lectures are only partly interactive.

### **9. Innovations and Best Practices**

none

### **10. Plans for Future Changes**

In the future an improvement could be achieved by interactive courses for 4-6 students during a concentrated time (1-2 weeks). By the use of electronic media (interactive cd-rom courses for PC), a more intensive learning would be possible. Furthermore, collaborative or integrated courses in

general medicine, general surgery, otorhinolaryngology and dermatology can help to provide students with a deeper knowledge and understanding which is essential for the dental practice.

## **11. Visitors' Comments**

Dental students are able to see and discuss a wide range of patients with different diseases, especially those, which relate to the oral mucosa and the skin of the head and neck.  
The demonstration and discussion of the pathology involved is an example of good practice.

## **8.4 General Surgery**

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### **1. Introduction**

The aim of the course is to give a brief overview on clinical appearance, diagnosis and treatment of selected surgical diseases. Traditionally, this lecture is placed early in the curriculum.

### **2. Primary Aims**

The primary aim is to refresh the understanding of biological-surgical mechanisms in order to create a basis for the understanding of surgical therapy.

### **3. Main Objectives**

The following selected surgical topics are discussed within this lecture:

- diagnostic procedures in surgery
- surgical emergencies
- wound healing, surgical treatment of wounds
- analgesia/ anaesthesia in surgery
- surgical infections
- acute abdominal pain
- bronchial carcinoma
- gastrointestinal tumors
- paediatric surgery
- orthopedic surgery
- transplantation surgery

### **4. Hours in the Curriculum**

This course is held semi-annually with one hour per week.

### **5. Method of Learning/Teaching**

The method of teaching is a lecture series.

### **6. Assessment Methods**

Attendance certificate at the end of the semester. In the final dental exam the students have a 2-day exam in General Surgery, where on the first day each student examines a patient and comes to a diagnosis. This is then the main topic of the student's oral exam on the second day.

### **7. Strengths**

none

### **8. Weaknesses**

none

**9. Innovations and Best Practices**

none

**10. Plans for Future Changes**

None

**11. Visitors' Comments**

Unfortunately there was no opportunity to meet representatives from this discipline.

**8.5 Otorhinolaryngology**

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**1. Introduction**

The lectures present anatomical and physiological basics and the main diseases in ENT.

**2. Primary Aims**

Symptoms, diagnostics and treatment of ENT diseases

**3. Main Objectives**

- Diseases of the salivary gland: Anatomy, histology and histopathology, diagnostics, inflammation, sialolithiasis, tumors,
- Lesions of the facial bones: Fractures (symptoms, diagnostics, operation)
- Diseases of the external ear: Inflammation, tumors, lesions
- Diseases of the middle ear: Anatomy, inflammation, special diseases of the chain
- Audiology: Physiology, types of hearing loss, hearing tests, BERA
- Vestibular system: Diseases, tests
- Benign and malignant lesions of the oral cavity and pharynx: Lips, tonsils, adenoids, mucosa, tongue
- Diseases of the neck: Lymph nodes, malformations, skin, soft tissue
- Benign and malignant diseases of the larynx: Inflammation, tumors, malformation , functional disorders
- Plastic surgery: Anatomy, reconstructive techniques, flaps
- Diseases of the nose and sinuses: Rhinitis, sinusitis, tumors, allergies

**4. Hours in the Curriculum**

The lectures run over one term , Fridays 8.00-8.45 (one hour per week)

**5. Method of Teaching/ Learning**

Themes are prepared by the lecturers, in the lecture hall slides are used to explain the subjects, discussions with the students

**6. Assessment Methods**

No test after the lectures but an examination at the end of study (orally)

**7. Strengths**

Basics of ENT in anatomy and physiology are presented in correlation to the symptoms, diagnostics and treatment of the diseases.

**8. Weaknesses**

The place in the time schedule is optimal. Nevertheless, the lectures are visited regularly only by a small number of students.

**9. Innovations and Best Practices**

No other courses at the same time

**10. Plans for Future Changes:**

None

**11. Visitors' Comments**

This course focuses on diseases of the oral and paranasal cavities. Students are taught in the Dental School and no patients are able to attend.

## Section 9: Orthodontics and Child Health Care

### 9.1 Orthodontics

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#### 1. Introduction

Undergraduate courses in orthodontics are performed during the 6<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> semester. The students attend the department in small groups (6-8 students) on a weekly basis. The undergraduate training is based on lectures, seminars, laboratory work and clinical hospitalizations with different main topics in each of the three courses.

Course 1: Orthodontic diagnosis (6<sup>th</sup> semester)

Course 2: Orthodontic appliances (8<sup>th</sup> semester)

Course 3: Orthodontic treatment (9<sup>th</sup> semester)

#### 2. Primary Aims

The students should be able to diagnose all forms of malocclusion and define the degree of orthodontic treatment need. They should be familiar with the procedures used by orthodontists and be able to recognize the development of orthodontic problems at an early stage in order to apply interceptive treatment modalities and select patients properly for treatment or referral (orthodontic specialists) in terms of malocclusion severity and timing.

#### 3. Main Objectives

Theoretical instruction (lectures and seminars)

- Physiology and pathophysiology of postnatal dentofacial growth and development
- Etiology and prevention of malocclusion
- Orthodontic diagnosis based on clinical data, dental casts, lateral headfilms, handwrist radiographs
- TMJ function and diagnosis of TMD
- Biological and mechanical principles of fixed and removable orthodontic appliances
- Orthodontic interception at different developmental stages of the dentition
- Characteristic and treatment approaches for the different malocclusion types (Class I, Class II and Class III) in relation to age.
- Orthodontic retention

Practical exercises

- Analysis of dental casts, lateral headfilms, handwrist radiographs and orthopantomograms
- Impressions, production and trimming of orthodontic casts
- Wire bending
- Fabrication of different removable appliances

Clinic

- Observe and assist the postgraduate students
- Oral hygiene instructions of orthodontic patients
- Diagnostic training in clinical patients
- Taking of initial patient records
- Fabrication of a removable appliance for a clinical patient

#### **4. Hours of the Curriculum**

In total (course 1-3) the students have 127 hours of lectures and seminars in small groups of app. 6-8 students. In the second and third course each student has 18 hours of clinical hospitalization with different learning goals.

#### **5. Method of Learning/Teaching**

Lectures, seminars, video-presentations, practical exercises, case analysis and treatment planning, clinical hospitalizations, laboratory work.

#### **6. Assessment Methods**

Theoretical knowledge is assessed using written exams at the end of each course. These exams comprise of short answer questions. The students must achieve 70% of the possible points to pass.

In the second course the practical exercises (wire bending, fabrication of orthodontic appliances) are stepwisely controlled by the instructors. In the third course the students must prepare a written case presentation (comprehensive diagnostic assessment and detailed treatment planning) which has to be defended. Furthermore, they have to perform diagnosis and orthodontic treatment planning on a clinical patient. The practical exercises, the case presentation and the clinical treatment planning are judged as satisfactory or non-satisfactory. In case of a non-satisfactory the task has to be repeated in order to pass the course.

#### **7. Strengths**

- All teaching in small groups (except lectures)
- Weekly scheduled topics
- Theoretical instruction is directly transferred to practice (treatment planning and practical work)

#### **8. Weaknesses**

- No orthodontic treatment by the students / only six dental chairs for undergraduate and postgraduate students
- Instruction is partially performed by postgraduate orthodontic students
- Frequently changing academic staff due to type of contract

#### **9. Innovations and Best Practices**

- Increased emphasis on orthodontic prevention and interception as well as TMJ diagnosis
- Participation at daily routine treatment

#### **10. Plans for Future Changes**

- Part of the teaching should be replaced by problem based learning
- Active involvement of students in patient treatment

#### **11. Visitors' Comments**

The case analysis and case presentation is especially positive in this Department. Each student presents a case to a small group with the Professor as an opponent, which should enable them to recognize those cases that they can treat and those which should be referred. The students must perform this exercise successfully to pass the course.

The visitors were told that more dental chairs are required in the Department to allow undergraduate students to treat minor Orthodontic cases. Since orthodontic treatments regularly are performed in general practice in Germany, this should be considered.

## 9.2. Paediatric Dentistry

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### 1. Introduction

Paediatric Dentistry is taught over 3 clinical semesters. Treatment of children by students is scheduled in the last clinical semester, when the students have acquired the theoretical basis and first practical experience in assisting pedodontic treatment.

### 2. Primary Aims

- to co-ordinate and carry out preventive and restorative therapeutical measures in infants, children and adolescents
- to transfer the knowledge which the students have acquired in other dental subjects to the specific age groups mentioned above and to determine the adequate moment to refer patients to specialists, such as orthodontists, oral surgeons, or paediatricians.

### 3. Main Objectives

- Prevention (correct nutrition, fluoridation, oral hygiene according to age groups)
- Reduction of children's fears, guidance of patients
- Dental treatment of handicapped children and adolescents
- Restoration of primary and young permanent teeth
- Endodontics in primary and young permanent teeth
- Tooth development and structural anomalies
- Traumatology
- Prosthetic dentistry in children

### 4. Hours in the Curriculum

- A 1<sup>st</sup> clinical semester: lecture "Dentistry for Children I" (14 hours), demonstrations (3 hours) and practical exercise (10 hours) on phantom heads
- B 2<sup>nd</sup> clinical semester: lecture "Dentistry for Children II" (14 hours), lecture "Caries Prophylaxis" (7 hours), Policlinic work in Dentistry for Children (7,5 hours), Assistance during treatment of infants (12,5 hours).
- C 5<sup>th</sup> clinical semester: lecture (3 hours), clinical course (35 hours) where the students treat children and adolescents, clinical seminar (14 hours).

### 5. Method of Learning/ Teaching

- Preparation for clinical work: theoretical lectures, exercises with anatomical models, assistance while treating children
- Children's treatment: initial findings, dental examination forms, setting up treatment plans according to patients' age, co-ordination / performance of prophylactic and conservative measures, enlargement of theoretical knowledge and discussion of clinical experience in seminars

### 6. Assessment Methods

Certifications of the student's successful participation in the phantom course and in the clinical courses for Conservative Dentistry; Final Examination: Paediatric Dentistry is a part of Conservative Dentistry in the National Dental Examination (Oral Examination).

## **7. Strengths**

Students are treating children in small groups, being instructed by post-graduate staff members. Clinically orientated diagnosis and treatment according to the problems arising from the clinical situation. As we have been organising practical training since 1976, during which students are treating children by themselves, there is always a sufficient number of patients available.

## **8. Weaknesses**

Special problems, e.g. the guidance of handicapped patients and of children with massive fear of dental treatment, can only be dealt with on a theoretical basis or demonstrated by licensed dentists.

## **9.+ 10. Innovations and Best Practices/ Plans for Future Changes**

- Problem-orientated learning in seminars: case studies on problematic patients using video technology in order to compensate for the difficulties stated above (Point 8).
- Attendance of students during treatment under insufflation anaesthesia.
- Paediatric aspects are to be more strongly taken into consideration in dental education

## **11. Visitors' Comments**

The existence of paediatric dentistry as an independent discipline is unusual in Germany and the arrangements in Giessen provide an important base for the development of the knowledge base in the discipline both for the Faculty and for students.

Prophylaxis is taught within this course mainly on an individual basis. Recently a project on a population was started and the clinic runs a prophylactic programme in a Kindergarten. Such initiatives are important and should be developed further.

Applied psychology for the child patient is taught in the department. However the student lack tuition on basic psychology principles.

The postgraduate program is unique and enhances the quality of care for young patients.

Special payment rates should be agreed with the social insurance authorities to provide care for some special groups eg children with Down's Syndrome or Osteogenesis Imperfecta

## Section 10: Public Dental Health and Prevention

No separate subject in the dental curriculum, but integrated in different courses. Preventive Dentistry is taught mainly in lectures and courses of Conservative Dentistry and Paediatric Dentistry. Aspects of epidemiology, statistics and health services (predominately related to caries) are integral part of the lectures in Conservative Dentistry, Paediatric Dentistry and Periodontology.

### Visitors' Comments

At present Public Dental Health is not included in the Curriculum required by the federal law, but there are plans to change this when the new legislation are introduced. A working group of the German Society for Conservative Dentistry is developing criteria for this aspect of the course. The members of the working group should be congratulated on this initiative. Although Prevention is taught for individual patients in most departments there is little opportunity for students to obtain the experience on a population basis. The University Kindergarten Project is a good example of the latter and should be encouraged and expanded. In the context of curriculum planning consideration should be given to including group prevention early in the preclinical course.

## Section 11: Restorative Dentistry

### 11.1 Preclinical Section

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#### 1. Introduction

The preclinical section consists of three courses, which are composed of lectures, demonstrations and lab courses. These courses give students the basic information about the stomatognathic system, dental materials, and prosthodontics. In the first semester (course of dental laboratory techniques) they acquire the basic knowledge of the usage of different materials, in the third semester (first phantom course) they construct different types of removable restorations, and during the vacation-course after the third or fourth semester (second phantom course) various fixed restorations are constructed.

#### 2. Primary Aims

The students acquire the basic knowledge for the clinical courses. They are given the theoretical background and are trained in manual dental skills.

#### 3. Main Objectives

##### Course of dental-laboratory techniques (propaedeutics)

- dental materials
- macromorphology of teeth
- anatomy and function of the stomatognathic system
- occlusion and articulation
- basic knowledge about caries and periodontal diseases
- basic knowledge about prophylaxis and oral hygiene (mutual intraoral investigation)
- impressions (alginate at manikin and each other)
- making of dental casts
- handling of average movement articulator
- wax-up technique
- bending of dental clasps
- proper use of plastic materials (construction of palatal plates and incorporation to one another)

##### 1<sup>st</sup> phantom course of prosthodontics

- dental materials
- consequences of tooth loss, concepts of therapy
- handling of adjustable articulators, face-bow-transfer, axle-related model assembly (exercise with each other)
- construction of removable dentures (partial denture, casted-denture, total denture)

##### 2<sup>nd</sup> phantom course of prosthodontics

- dental materials
- indications of different fixed restorations
- preparation of teeth (on manikins and dental casts)
- correction casting, sawing model production
- construction of fixed restorations (all-cast gold crown, tooth colored crown, hollow crown, pin-crown, sanitary bridge, tangential bridge)

#### 4. Hours in the Curriculum

##### 1<sup>st</sup> semester:

course: 18 hours per week  
 lecture: 2 hours per week  
 demonstration: 2 hours per week

**3<sup>rd</sup> semester:**

course: 15 hours per week  
 lecture: 1 hour per week  
 demonstration: 2 hours per week

**after 3<sup>rd</sup> or 4<sup>th</sup> semester:**

course: 18 hours per week  
 lecture: 2 hours per week  
 demonstration: 2 hours per week

The courses have to be attended in this given sequence, since they are put in order with increasing difficulty.

**5. Method of Learning/ Teaching**

The courses consist of lectures, demonstrations, and the practical lab course. The lectures deliver the basic information about dentistry and dental materials, the students acquire the theoretical knowledge about the practical exercises to be performed in the lab. The demonstrations are given in front of a camera and each of the exercises the students have to perform is explained step by step. This includes demonstrations at patients. Each student has his own place in the lab, which is equipped with the required instruments. The students are divided into groups, which are supervised by one instructor. The relation of students to instructors is 12:1.

**6. Assessment Methods**

The practical skills are assessed through a „Testattheft“. Students need to show intermediate steps of their work to their instructor. For each regularly performed step, the students get a signature in their „Testattheft“. The final work is examined by the head of the department. If at the end of the course the different exercises have not been completed satisfactorily, the student has not achieved the course goal and must repeat the course.

The theoretical knowledge of the students is tested continuously throughout the course by means of questions, homework, or short tests. At the end of the semester a written exam of approximately 30 questions is given. The students have to reach at least 60% to pass. If the written exam is failed, but acceptable practical work has been performed throughout the course, the student has the possibility to attend an oral exam.

After the preclinical section there is a practical and oral exam in restorative dentistry as part of the „Physikum“. The oral exam consists of tooth-identification and knowledge of the stomatognathic system, dental materials, and prosthodontics. The practical part comprises the construction of various fixed and removable dental restorations. If a student does not achieve a sufficient result in either part, he has to repeat the entire exam.

**7. Strengths**

Students work in relatively small groups with a relation of students to instructors of 12:1. Although lectures, demonstrations, and the lab course are planned at separate times in the schedule, in reality they are flexible, so that the theoretical and the practical education correspond. The students practice clinical techniques on each other.

**8. Weaknesses**

Due to tightness of the schedule, the repetition of a course automatically prolongs the dental training by one semester.

By capacity decree, the relation of students to instructor in the preclinical section should be 20:1. This however would decrease the efficiency of student education. To achieve the given relation of 12:1, all instructors have to be present in the lab at all times, with the consequence that this time is missing for other tasks.

As the number of students in the preclinical section often exceeds the number of laboratory places available, the course admittance sometimes is decided by lot.

The students only have the opportunity to work on individual manikins, simulating the clinical situation during the third course, as in the preclinical lab there is not enough space for manikins at each working place.

## **9. Innovations and Best Practices**

The students don't only practice at the phantom head in the lab, but also mutually at the dental units of the clinical department.

## **10. Plans for Future Changes**

none

## **11. Visitors' Comments**

Lectures about dental materials are well integrated into the practical training of the students. The time devoted to this type of course should be reviewed since there is a similar course later in the curriculum directly related to clinical prosthodontics. The visitors understand that the main objective is to prepare students for the exam according to the Federal Law, and cannot be changed until new rules are in force.

The visitors appreciated the efforts of the staff who devote a considerable time to teaching. The ratio of teachers: students is 1:12 compared to 1:20 which is the time allocated by the budget.

## **11.2 Conservative Dentistry**

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### **1. Introduction**

In most German dental schools „Conservative Dentistry“ (Zahnerhaltungskunde) comprises the subjects Restorative Dentistry (except Prosthodontics), Endodontics, Paediatric Dentistry and Periodontology. In contrast to this, the dental school in Giessen has three different departments (Conservative and Preventive Dentistry, Paediatric Dentistry and Periodontology) and one sub-department (Endodontics) for these disciplines. They are taught during the 6<sup>th</sup>, 7<sup>th</sup> and 10<sup>th</sup> semester. Conservative and Preventive Dentistry, Paediatric Dentistry, Endodontics and partly Periodontology are integral parts of the Phantom course (6<sup>th</sup> semester) and the two clinical courses (7<sup>th</sup> and 10<sup>th</sup> semester), but have their own lectures and seminars. At the end of the dental trainig program all of the above mentioned disciplines are parts of one certificate.

### **2. Primary Aims**

To give the students the theoretical knowledge to understand the biological basis for caries and the practical skills to prevent, to diagnose and to treat dental caries.

### **3. Main Objectives**

- Structure and function of dental hard tissues
- Oral environment and oral ecology related to dental caries
- Etiology of dental caries
- Epidemiology of dental caries
- Clinical and pathological features of dental caries
- Caries prevention strategies
- Diagnosis of dental caries
- Non-invasive and minimal-invasive treatment, adhesive dentistry and conventional restorations (amalgam and gold-cast restoration)
- Diagnosis, prevention and treatment of non-carious lesions (particulary dental erosions)

### **4. Hours in the Curriculum**

(per week, totally 14 weeks per semester)

6<sup>th</sup> semester: Phantom course of Conservative Dentistry

- 12 hours practice, 2 hours demonstration  
(one-third is reserved for Endodontics)
- 4 hours lectures (Endodontics included)

**7<sup>th</sup> semester: Clinical course of Conservative Dentistry I**

- 14 hours treatment of patients (1 : 1 treatment/assist)  
(Endodontics and preventive measures included)
- 1 hour seminar/demonstration
- 1 hour lecture (shared with Paediatric Dentistry)

**10<sup>th</sup> semester: Clinical course of Conservative Dentistry II**

- 16 hours treatment of patients (1 : 1 treatment/assist)  
(Endodontics and Paediatric Dentistry included)
- 1.5 hours seminar/demonstration
- 1 hour lecture (shared with Endodontics and Paediatric Dentistry)

**5. Method of Learning/ Teaching**

The phantom course is equipped with manikins allowing wet preparation techniques. Whenever needed, the lectures are accompanied by practical demonstrations. During the 7<sup>th</sup> and 10<sup>th</sup> semester dental education is focused on treatment of patients under strict supervision of instructors. Special treatment problems are discussed in seminars. One lecture (etiology and preventive aspects) was changed into an open seminar allowing small groups of students to prepare lessons and demonstrations by themselves.

**6. Assessment Methods**

At the end of the phantom course a written and a practical test must be passed. In the phantom course and the clinical courses every single treatment step is assessed by an instructor. A minimum number of treatments (examinations, restorations, preventive measures) is required to pass the course.

**7. Strengths**

The technical equipment is excellent. The two clinical courses guarantee a high amount of practical experience including new technologies.

**8. Weaknesses**

The interdisciplinary education standard is not high enough. Especially during the 6<sup>th</sup> semester the students are burdened heavily and there is few time left for personal discussions and contacts between students and staff-members.

**9. Plans for Future Changes**

A part of the lectures will be changed into seminars where the students are taught in small groups. A first trial with problem-based-learning is planned. Laboratory work (manufacturing of inlays) will be minimized or abolished.

**10. Visitors' Comments**

Visitors were impressed by the amount of scientific topics covered by the course and by the innovative techniques used.

Clinical activity reflected the latest research. A good example of this was the teaching of erosion and toothbrushing.

## 11.3 Endodontics

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### 1. Introduction

Endodontics is not taught as an independent discipline, but is integrated as a substantial part of the three courses of Conservative and Preventive dentistry:  
 Phantom course of Conservative Dentistry, 6<sup>th</sup> semester  
 Clinical course of Conservative Dentistry I, 7<sup>th</sup> semester  
 Clinical course of Conservative Dentistry II, 10<sup>th</sup> semester

### 2. Primary Aims

The primary aims are to enable the students to understand the physiology and pathology of the dental pulp and to select and carry out suitable therapeutic measures.

### 3. Main Objectives

- Principles and physiological functions of the pulp, dentin and apical tissue
- Pathology of the pulp, dentin and apical tissue (inflammation and traumatic injury)
- Endodontic diagnosis
- Therapeutic measures intended to maintain the vitality of the dental pulp
- Methods of root canal preparation
- Root canal filling techniques
- Endodontic pain management
- Revision of insufficient root canal fillings
- Post-endodontic treatment (bleaching techniques, restoration of endodontically treated teeth)

### 4. Hours in the Curriculum

One-third (i.e. 50 hours within 4 weeks) of the total time available in the Phantom course is reserved for Endodontics. Students do not have distinct amounts of time for Endodontics in the two clinical courses. It can be roughly estimated, that about one-third of the time available is spent on endodontic measures.

### 5. Method of Learning/ Teaching

During the Phantom Course the theoretical principles of Endodontics are taught in lectures. Practical aspects of endodontic therapy are demonstrated with audiovisual aids (10 video tapes) and basic endodontic techniques are practiced using extracted teeth.

In the first clinical course, the root canal treatment of at least two single rooted is accompanied by lectures (1 h weekly) concentrating on problems associated with endodontics.

More complicated endodontic cases (at least one multi-rooted tooth) are the subject of the second clinical course. Clinical demonstrations by staff members concentrate on eliminating individual endodontic deficiencies of the students.

### 6. Assessment Methods

Successful participation in the three courses is certified as far as appropriate qualitative and quantitative management of clinical endodontic diagnosis and therapy has been performed, as assessed by experienced staff members. The certificate for the Phantom Course additionally requires passing a theoretical exam.

### 7. Strengths

The courses focus in detail on endodontic topics and guarantee a high amount of practical experience.

## **8. Weaknesses**

Interdisciplinary education standard is low.

## **9. Innovation and Best Practices**

Introduction of modern manual and rotating root canal preparation procedures as well as efficient root canal filling methods.

## **10. Plans for Future Changes**

Interdisciplinary patient management regarding Conservative/Endodontic Dentistry and Prosthodontics as well as Periodontics.

## **11. Visitors' Comments**

The independence of endodontics is beneficial for the education of the students and for the maintenance and development of competence within this specific area.

A change to more student-centered learning with seminars instead of lectures is a strength.

There are excellent clinical student facilities e.g. microscope and digital radiography.

Teaching is provided according to the Guidelines of European Society of Endodontontology.

## **11.4 Prosthodontics**

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### **1. Introduction**

Fixed and removable prosthodontics programmes introduce the student to the options available for restoration of partly dentate, and edentulous, adult patients on an acceptable and appropriate biological and functional basis. These programs comprise principles involved in assessment and construction of fixed and removable types of prostheses as well as management of the edentulous state. Students are trained to develop and execute treatment plans based on a problem related patient's history and structured clinical and x-ray examination.

The clinical education in prosthetic dentistry comprises two courses, each with a concomitant seminar and two lectures :

- Clinical course I of Prosthetic Dentistry (including 3-week initial training programm)  
Supervisor: Prof Dr. B. Wöstmann
- Clinical course II of Prosthetic Dentistry  
Supervisor: Prof. Dr. P. Ferger
- Lecture Prosthodontics I (fixed prosthodontics)
- Lecture Prostodontology II (removable prosthodontics)

### **2. Primary Aims**

- Comprehensive understanding of prosthodontic principles on a scientific basis
- Treatment planning with respect to success rates of the different therapeutic media

### **3. Main Objectives**

Theoretical instruction

- Knowledge about the anatomy and function of the stomatognathic system
- Fundamentals of dental materials

- Problem orientated treatment approach
- Development of individual treatment plans
- Principles of design and construction of prosthetic restorations
- Case presentations and discussions

#### Clinical instruction

- Pretreatment procedures
- Treatment of a patient with fixed prostheses
- Treatment with removable partial dentures (clasp retained)
- Treatment with attachment retained partial dentures
- Implant-supported prosthodontics
- Rehabilitation of the edentulous patient
- Systematic recall of treated patients
- Participation in the Prosthodontic Ambulance Service

#### Laboratory instructions

- Basic technical procedures
- Framework design
- Communication with the dental laboratory

### **4. Hours in the Curriculum**

7<sup>th</sup> Semester

Lecture Prosthodontics I – fixed prosthodontics – 2 hours per week

#### **Lecture Prosthodontics II – removable prosthodontics, edentulous patients – 2 hours week**

Introductory Clinical and Laboratory Programme: - 30 hours

Course Prosthodontics I

- 12 hours per week clinical treatment
- 12 hours per week laboratory work
- 2 hours per week concomitant lecture
- 15 hours per semester assistance in ambulance service
- 15 hours per semester examination of recalled patients

Course Prosthodontics II

- 16 hours per week clinical treatment
- 12 hours per week laboratory work
- 2 hours per week concomitant lecture
- 30 hours per semester assistance in ambulance service

### **5. Method of Learning/ Teaching**

Strictly supervised clinical treatment

Supervised laboratory exercises

Problem-based learning, the students must report special cases once a week in a one hour seminar

Case-based learning

Topic-based learning

Recommended reading to consolidate the learned topics

### **6. Assessment Methods**

Clinical supervision by instructors

Oral examinations

Written examination prior to patient treatment in course I

Clinical Credits

### **7. Strengths**

Closed dialog between students and instructors

Students are trained in all modern prosthetic treatment options not only theoretically but also in practice

Every single student has incorporated at least one telescopic retained partial denture  
Continuous program of oral health for the department's patients  
Students learn to handle computer based clinical documentation systems

**8. Weaknesses**

Lack of adequate patients for the courses  
limited number of staff members due to financial restrictions

**9. Innovations and Best Practices**

Including students into research projects  
Introduction of a quality management system  
Computer based documentation system in service

**10. Plans for Future Changes**

Extending multimedia supported learning methods  
Expanding of the quality management system above and certification according ISO 9000ff  
Solving the problems mentioned under Weaknesses above.

**11. Visitors' Comments**

The focus on diagnosis, treatment planning and clinical decision making is a teaching strength.  
The ambulance system offers good opportunities for students to regularly present cases in small groups. Teachers evaluate these.  
The patient recall and the computer based medical record offer a good basis for student enhancement and assessment.

## Section 12: Periodontology

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### 1. Introduction

Undergraduate teaching in periodontology comprises 3 courses including the respective lectures and seminars:

A Propedeutic Course of Periodontology	6 <sup>th</sup> semester
B Clinical Course of Periodontology I	7 <sup>th</sup> semester
C Clinical Course of Periodontology II	10 <sup>th</sup> semester

### 2. Primary Aims

According to the guidelines of the European Federation of Periodontology the students should have a broad basic scientific knowledge of periodontology, intensive knowledge of clinical periodontics and implantology as well as clinical expertise in the presentation, diagnosis and management of early and moderate periodontal diseases.

### 3. Main Objectives

- Development, anatomy and physiology of the periodontal structures
- Pathogenesis of periodontal diseases
- Microbiology of periodontal flora
- Immunology of periodontal inflammation
- Epidemiology of periodontal diseases
- Diagnostics (biochemical, clinical, immunological, microbiological, radiographical)
- Prevention of plaque accumulation and gingivitis
- Therapy of gingival diseases
- Periodontal therapy (conservative, professional plaque control, occlusal adjustment, treatment planning)
- Periodontal surgery (gingivectomy, flap surgery, guided tissue regeneration)
- Periodontal plastic surgery (flap management, root coverage, resective measures)
- Implant therapy (materials, healing of implants, soft tissue barrier, periimplantitis)
- Treatment planning and supportive periodontal care

### 4. Hours in the Curriculum

Depending upon the number of students in the semester each student spends a maximum of one afternoon per week (6<sup>th</sup> and 7<sup>th</sup> semester) in the course. Since the capacity for practical instruction may vary, this could be reduced to less than one half day/week.

A student of course II (10<sup>th</sup> semester) spends a maximum of one morning per week (3 hours) in the course.

### 5. Method of Learning/ Teaching

Lectures, Hands-on-courses, practical teaching during treatment sessions. In the first course all students must complete 2 written treatment plans using the forms of the department.

In all courses practical instructions are given in small groups and special intensive training courses are included, i.e. supragingival debridement (1<sup>st</sup> course) subgingival scaling and root planing (2<sup>nd</sup> course), perio-surgical procedures using animal tissue (3<sup>rd</sup> clinical course).

During the 2<sup>nd</sup> course students are introduced into teamworking and problem-based-learning, i.e. they are asked to answer a clinical scientific question based on scientific evidence coming from the international published peer-reviewed literature.

## **6. Assessment Methods**

Written examination at the end of each course, oral examination at the beginning of the 1<sup>st</sup> course (B).

Since two years at the end of the 3<sup>rd</sup> course the students are asked to assess the quality of their education on an anonymous questionnaire.

## **7. Strengths**

Students are treating patients with periodontal diseases and are instructed by post-graduate staff members. Besides technical skills, an introduction into problem-based-learning is given.

Also the students in the 3<sup>rd</sup> course are seeing patients, who are under supportive periodontal care, demonstrating the long term benefits of local therapy in conjunction with a regular recall.

## **8. Weaknesses**

The number of staff is very limited, also at least one position for a dental hygienist is missing. Treatment facilities are varying according to the number of students in the different courses, since facilities of the conservative dentistry department are used for practical training.

## **9. Innovations and Best Practices**

Beginning with the last year in addition to lectures a seminar has been introduced to allow the students to actively participate in the learning process by preparing reports on scientific topics.

## **10. Plans for Future Changes**

The establishment of a whole patient "treatment philosophy" in the last clinical course would be beneficial to improve treatment planning capabilities and to see a comprehensive approach in patients with multiple treatment needs.

## **11. Visitors' Comments**

- There are enthusiastic staff with modern teaching potential.
- Teaching is provided according to the Guidelines of European Federation of Periodontology. This is an example of innovative good practice.
- Students are given a broad basic scientific knowledge of Periodontology and practical instruction in small groups; special intensive training courses are included e.g. periosurgical procedures using animal tissue.
- There are strong research links with the basic science departments.
- A law, which allows the training of dental hygienists, was introduced in 1999 and there is interest in establishing a school in Giessen. This would require investment in additional staff and facilities but would be a valuable and interesting development.
- The Periodontal and Conservative Department cooperate closely and there are plans to introduce integrated patient care by students. This is most welcome and should be encouraged.
- Students are issued with questionnaires to assess the quality of the teaching. All of these are returned and analyzed and the information is used to improve performance. This is an example of good practice.
- There is a need for more dental hygienists to improve the treatment capacity.

## **Section 13: Oral and Maxillofacial Surgery, Dental Radiography and Radiology**

Department of Oral Surgery and Dental Polyclinic

Department of Maxillofacial Surgery

(The Departments will be united from October 1st, 2000. )

The lectures and courses are held by the Department of Oral Surgery and Dental Polyclinic together with the Department of Maxillofacial Surgery.

Two locations:

Oral surgery - within the dental clinic

Maxillofacial surgery - within the complex of general surgery/neurosurgery/urology.

### **13.1 Oral Surgery**

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The following courses and lectures are offered:

Lectures:

A. Oral Surgery

Courses:

B. Local anesthesia and i.v. infusion

C. Operation Course 1

#### **1. Introduction**

A. The lectures in Oral Surgery cover oral surgery including implantation, trans- and reimplantation and is scheduled in the 7th or 8th semester.

B. The course Local anesthesia is scheduled in the 6th semester. Students apply local anesthesia and take peripheral venous blood. An introductory lecture series covers (general) emergency treatment.

C. The Operation Course 1 is scheduled in the 8th semester. Students are supervised on a one-to-one basis. During one week the students work in the operation theatres. They perform local anesthesia and basic surgical procedures like extractions, incisions, easy osteotomies and suturing. On phantoms they perform implantations, apicectomies and endodontic implants.

The following week students are in the polyclinic (see also: oral medicine and chapter 15 General Dental Emergency Service). They report patients' history and perform extra- and intraoral examinations. Furthermore they perform local anesthesia. They operate or assist in acute dental treatments (incision of abscesses, dental trauma, pain treatment) and undertake postsurgical treatments (controls, removal of drains and sutures).

#### **2. Primary Aims**

Basic knowledge and skills in oral surgery

Training in examination of patients and reporting diagnosis

#### **3. Main Objectives**

Anesthesia

Emergency treatment

Dental emergency treatment

Diagnosis of intraoral diseases

Dental traumatology

Oral surgery

Trans- and reimplantation of teeth

Implantation

#### **4. Hours in the Curriculum**

- A. The lecture series (45 minutes) is held in the winter semester for the 7th and 8th semester.
- B. The course Local Anesthesia is scheduled in the 6th semester. Introductory lecture series is 5x60 minutes. The course consists of 120 minutes for local anesthesia and 120 minutes for i.v. infusion (groups of 4-6 students)
- C. The Operation Course 1 is held in the 8th semester. Course duration is 1 week (5 hours per day) in the operation theatre and 1 week (5 hours per day) in the policlinic. Demonstrations on surgery are 60 minutes per week for the whole semester ("Live operations").
- There is a possibility to practice another week or more after the 9th semester (voluntary). There are possibilities for extractions in other courses, during emergency treatment and during the Course in Maxillofacial Surgery.

#### **5. Method of Learning/Teaching**

Lecture: Slides, TV/Video

Courses: Patient treatment on a one-to-one basis: demonstrations, assists, treatments under supervision; written case reports

#### **6. Assessment Methods**

- A. Lecture series: Final Dental Exam
- B. and C. Courses Anesthesia and Operation Course 1:  
Individual evaluation during the course. Evaluation of written reports. Attendance certificate after the course. Certificate at the end of the semester.

#### **7. Strengths**

Demonstration of oral surgery relevant for the dental office. Many patients with systemic diseases which have to be taken into account in dental treatment. Additional voluntary treatment after the 9th semester. Since the students are in the policlinic the week after the surgery week they can follow the natural course of healing.

#### **8. Weaknesses**

Sometimes not enough "simple cases" that are suitable for treatment by students. Not enough time in the curriculum.

Lectures of internal medicine, pharmacology, ENT and pathology are not well attended due to high demands in dental courses. This results in bad knowledge in these fields and there is a need of repeating the items in the surgical courses.

#### **9. Innovations and Best Practices**

Dental traumatology

Surgical tooth maintenance

#### **10. Plans for Future Changes**

Educational case library, educational library for procedures (e.g. extraction, osteotomy, dental splinting, local anaesthesia), computer assisted learning

#### **11. Visitors' Comments**

The lack of patients for routine Oral Surgery is unfortunate and the clinical experience that students gain varies. A second mandatory one-week block might overcome this difficulty.

The visitors welcome the plans to create a Department of Oral and Maxillo Facial Surgery from the two departments of Oral Surgery and Maxillo Facial Surgery in October 2000. It is important that the combined staff establishment is maintained during this process.

## 13.2 Maxillofacial Surgery

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The following courses and lectures are offered:

Lectures:

A. Maxillofacial Surgery

Courses:

B. Maxillofacial Course (Operation Course 2)  
 C. Bedside teaching

### 1. Introduction

- A. The lecture series and the Course of Oral Medicine are scheduled as one unit lasting 2 hours a week. The lecture is voluntary, whereas the course is obligatory, so a wide presence of students is achieved. To get the certificate at the end of this semester, the students have to attend the lectures and course regularly, also they have to report a patients history to the auditorium.
- B. The Operation Course 2 is scheduled in the 9th semester (3 days) and directly after the 9th semester (1 week). Based on the knowledge of the lectures and Operation Course 1 students participate in theatre operations, in consultations in the outpatient clinic, and on the ward.
- C. Bedside teaching is scheduled in the 10th semester and performed once a week for up to 4 students.

### 2. Primary Aims

Diseases, trauma, symptoms and syndroms in the cranio-maxillofacial region and their treatment.  
 Indications and limitations of outpatient surgical treatment.

### 3. Main Objectives

Lectures:

Traumatology  
 Tumor diagnosis and therapy  
 Inflammatory processes  
 Orthognathic Surgery  
 Temporomandibular joint diseases  
 Salivary gland diseases  
 Craniofacial Surgery  
 Orbital Surgery  
 Surgery of Cleft lip and Cleft palate

Courses:

Training to take up patients history  
 Training of extractions  
 Training of assistance in oral operations  
 Training of assistance in maxillofacial operations

### 4. Hours in the Curriculum

- A. The lectures are held during the semester for the 8th and 9th semester (90 min).
- B. The Course is split into two parts, the first part is in the 9th semester (3 days), the second part is after the 9th semester (1 week).
- C. Bedside teaching is held during the semester for the 10th semester (60 min.)

### 5. Method of Learning/ Teaching

A Lectures: Slides, TV/Video, overhead projection of x-rays and CT-scans.

B Practical exercises of an assistant with one or two students in the course (one or two students in the operation room plus one or two students in the outpatient clinic or on the ward).  
 C Bedside teaching in small groups (3 students max.)

## **6. Assessment Methods**

End of semester certificate for regular attendance of lectures and courses and for a successful patients history report in the auditorium. The lectures have to be attended regularly (attendance will be controlled), each student has to report a patient's history.

## **7. Strengths**

During the Operation course 2 there are many opportunities to learn extractions and there are many patients with cardiovascular diseases expecting cardiovascular surgical treatment, who are admitted from the Kerckhoff-Klinik, Bad Nauheim, for surgical treatment of the mouth.  
 Practicing (and assisting) the whole range of dental and oral- and maxillofacial diseases. A wide range of different diseases is presented to the students.

## **8. Weaknesses**

Necessity of long courses: this interferes with other dental courses, e.g. orthodontics, prosthodontics. There is more pressure in the other courses, so students tend to go there.  
 Extractions cannot be scheduled, so sometimes students cannot practice them enough.  
 Efficient skills in presurgical diagnostics need basic knowledge of internal medicine, ENT, general pathology and pharmacology. These lectures are often not attended regularly because of high demands in dental courses. This results in basic mistakes in surgery, e.g. extractions in patients with compromised liver function or anticoagulation. Therefore, the teaching in oral- and maxillofacial surgery needs additional support in internal medicine, pharmacology, etc.

## **9. Innovations and Best Practices**

Video transmission of intraoral pictures helps with the demonstration of the cases. Planning of orthognathic surgery follows systematic principles using a 3D planning device (Girrbach-Krenkel).

## **10. Plans for Future Changes**

Educational case library, educational library for procedures (e.g. extraction, osteotomy, dental splinting, local anaesthesia)

## **11. Visitors' Comments**

The facilities for the teaching of Maxillo-facial Surgery and associated diseases is most impressive, particularly the large Operating Theatre which is dedicated to the discipline. It is essential that this situation be protected.  
 The one-week teaching block, which allows students to gain experience in major and minor Oral Surgery, the treatment of trauma and the management of emergencies are examples of good practice and should be protected. It is important that curriculum pressures should not affect this teaching block and consideration should be given to extending the time allocated.  
 Patient care in implantology is well integrated through joint clinics between the disciplines.  
 However, it is difficult for students to attend the special sessions that are provided because of the numbers involved, but there are historical case presentations, which are commended.

## 13.3 Radiography and Radiology

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### 1. Introduction

The course takes place in the 7th semester (2nd clinical semester). It includes theoretical and practical parts. It provides knowledge and skills for the use of X-rays in dentistry, diagnosis of radiographs and radiation protection. Besides the scheduled course students are involved with radiologic items (including taking x-rays, diagnosis and special knowledge) throughout the clinical semesters (6-10) in all courses (orthodontics, endodontics, periodontics, surgery).

### 2. Primary Aims

Radiation protection.  
 Learning dental radiographic techniques and diagnosis.

### 3. Main Objectives

- Physical basis
- Biologic considerations
- Radiation protection
- Legal basis
- Techniques of Dental Radiology
- Diagnosis of radiographs

### 4. Hours in the Curriculum

Lectures: Theory and radiation protection: 90 min per week  
 Course of Diagnostics: 45 min per week  
 Course of practical training: 2x 90 min

### 5. Method of Learning/ Teaching

Lectures with slides, overhead, TV/Video  
 Training on phantom heads and patients in small groups (4-5 students)

### 6. Assessment Methods

Oral examination or written test at the end of the course.

### 7. Strengths

none

### 8. Weaknesses

The course (or parts) should be held in the 6th semester to provide knowledge and skills before the first patient contact in the 7th semester. During the course only theory on digital imaging can be taught.

### 9. Innovations and Best Practices

none

### 10. Plans for Future Changes

Course (or parts) in the 6th semester. Computer assisted learning.

## **11. Visitors' Comments**

The timetable of radiology teaching is currently causing problems and should be addressed through curriculum planning. Digital X-ray equipment should be introduced.

## Section 14: Oral Medicine and Oral Pathology

### 14.1 Oral Medicine (Zahn-, Mund- und Kieferheilkunde)

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Lectures and courses are held by  
 (until Summer 2000)

Department of Oral Surgery and Dental Polyclinic (A,B,C,D,E,G)  
 Department of Maxillofacial Surgery (A,B,F)  
 Department of Dentistry for Children (A)

(from Summer 2000)

Department of Maxillofacial Surgery (A-G)  
 Department of Dentistry for Children (A)  
 Department of Periodontology (A)

Lectures offered:

- A. Oral Medicine 1 (ZMK I)
- B. Oral Medicine 2 (ZMK II)

Courses offered:

- C. Auscultando
- D. Practicando I
- E. Practicando II
- F. Practicando III
- G. Course Dental Polyclinic (integrated part of Operation Course 1; see also 13.1 Oral Surgery and 15 General Dental Emergency Service)

#### 1. Introduction

There are lectures in the 6th and 7th or 8th semester. Courses start in 6th semester and end in the 9th semester. In these courses patients are examined by students under supervision and clinical and radiological diagnosis are developed together with the lecturer. The courses are focussed on oral medicine and systemic diseases. The Course Polyclinic (8th semester) is included in the Operation Course 1. In this course students examine and treat outpatients which are referred to the department. These are especially patients with different oral diseases. From the 6th to the 8th semester outpatients are presented (pain diagnosis and therapy, infections, dental trauma, oral diseases, presurgical examination), in the 8th and 9th semester inpatients are presented.

#### 2. Primary Aims

Knowledge of oral diseases including diseases of the head and neck region.  
 Diseases with indispensable and optional oral manifestations.

#### 3. Main Objectives

- Inflammation – infection
- Abscesses
- Wound healing
- Bone pathology
- Diseases of maxillary sinus
- Epithelial and mesenchymal tumors
- Salivary gland diseases
- Craniofacial dysmorphogenesis
- Cleft lip, cleft palate
- Dental focus
- Compromised patients with medical risk factors
- Allergic reactions

#### **4. Hours in the Curriculum**

- A. Lecture series ZMK I is held in the 6th semester, 90 minutes per week
- B. Lecture series ZMK II is held in the winter semester for the 7th and 8th semester, 90 minutes per week
- C. Course auscultando is held in the 6th semester, 60 minutes per week
- D. Course practicando I is held in the 7th semester, 2x60 minutes per week
- E. Course practicando II is held in the 8th semester, 2x60 minutes per week
- F. Course practicando III is held in the 9th semester, 60 minutes per week
- G. Course Dental Polyclinic is held in the 8th semester, duration 1 week

#### **5. Method of Learning/Teaching**

- A, B. Lectures with slides, overhead - discussions, questions
- C-F. 2 students perform the clinical examination of patients (clinical and radiological diagnostics) under supervision and present the results to the auditorium (rest of semester). Discussions with supervisor.
- C-E. problem-based learning (special tasks for individual students/presentation to the auditorium, written case reports and written epicritical discussions)
- G. Patient examination and treatment on a one-to-one basis: examinations, assists, treatments under supervision

#### **6. Assessment Methods**

- A,B. Lecture: Final Dental Exam
- C-E. Course: attendance certificate, individual valuation of examination and diagnostics, evaluation of case presentations, evaluation of written case reports and epicrisis; certificate at the end of the course
- F. Attendance certificate
- G. Attendance certificate, individual evaluation, certificate at the end of the course (part of Operation Course 1)

#### **7. Strengths**

Comprehensive teaching of oral diseases. Many patients with severe systemic diseases or organ transplants are presented (e.g patients sent from a nearby center for heart diseases)

#### **8. Weaknesses**

none

#### **9. Innovations and Best Practices**

Introduction of problem-based learning some years ago.

#### **10. Plans for Future Changes**

Extension of problem-based learning.

#### **11. Visitors' Comments**

Included in Oral and Maxillo Facial Surgery

### **14.2 Oral Pathology**

is taught as part of Oral Medicine (14.1) and Pathology (7.3). See there.

## Section 15: Dental Emergencies

### 15.1 Conservative Dentistry

No separate subject of dental curriculum, but integrated in lectures and courses of Conservative Dentistry, Endodontics, Paediatric Dentistry and Periodontology (see there).

### 15.2 Prosthodontics

The prosthodontic ambulance service is an integrated part of the course of prosthodontics. In the 8<sup>th</sup> semester the students spend 15 hours assisting in the ambulance service, in the 9<sup>th</sup> semester 30 hours.

### 15.3 General Dental Emergency Service

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#### 1. Introduction

This is not a separate subject in the German dental curriculum, but an integrated part of different courses (e.g. see 13.1 Oral Surgery, but also in all other courses)  
 In the 8th and 9th semester students assist and treat under supervision at the Dental Emergency Service at night and on weekends. This work is voluntary and is paid.

#### 2. Primary Aims

Diagnosis and treatment in emergency cases.

#### 3. Main Objectives

Pain treatment  
 Dental traumatology  
 Infection control  
 Selection criteria for inpatient treatment

#### 4. Hours in the Curriculum

Dental Emergency Service: About 30 students have to cover half a year. On average this results in 6 days of treatment.  
 Dental Polyclinic: 1 week (5 hours per day) (see 13.1 Oral Surgery)

#### 5. Method of Learning/Teaching

Assistance and treatment under supervision on a one-to-one basis (in the course Dental Polyclinic and at the Dental Emergency Service) or in small groups (in other courses).

#### 6. Assessment Methods

Part of course demands - individual evaluation or certificates.

#### 7. Strengths

none

#### 8. Weaknesses

Dental Emergency Service: The participation is voluntary. Some students don't take part.

**9. Innovations and Best Practices**

none

**10. Plans for Future Changes**

None

**11. Visitors' Comments**

The 24-hour emergency dental service is an example of good practice and student involvement should become mandatory when circumstances permit.

## Section 16: Practice Management

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### 1. Introduction

Practice Management, Communications and Ethics are mainly being taught in the context of the lecture "Berufskunde" (professional instruction) in the 10<sup>th</sup> semester.

### 2. Primary Aims

The aim is to point out the ethical basis for the medical profession in order to prepare the students for their own professional practice. Experts on diverse fields of the public health system (the Chief Executive of the University Hospital, representatives of Social Insurances and Professional Associations) serve as lecturers.

### 3. Main Objectives

- Medical confidentiality and the duty to inform the patient of possible risks associated with treatment, documentation of records, legal safe keeping periods of records
- legal relationship between patients, social insurance companies and dentists
- start of professional work: occupation as assistant dentist, social insurance registration, opening or taking over of a dental practice, employment perspectives in the public health system
- Tasks of dentists' professional associations
- Balancing of dental services (regulations of social and private insurance companies, status of privately insured patients)
- professional insurance, retirement insurance for dentists (insurance supplied by professional associations)
- economic efficiency and quality assurance in dental medicine; dental staff management

### 4. Hours in the Curriculum

14 hours in the 10<sup>th</sup> semester. The lecture is given in 2-hour blocks during the first half of the semester

### 5. Method of Learning / Teaching

As the representatives of the diverse fields report on their own practical experience, the students are offered a considerable amount of information and recommendations in addition to the theoretical topics. It is up to the lecturers to offer their curriculum in the form of role play, question-answer method, lectures or in a combination of the above.

### 6. Assessment Methods

As the lecture deals with all fields of the future professional work including legal and ethical aspects, the students' personal interest in the topic is so great that tests are not performed.

### 7. Strengths

- significant practical relevance for future professional activities
- possibility of comparing different systems, partly in competition to each other (e.g. social and private health insurance)

### 8. Weaknesses

- The issues taught need to be constantly checked for neutrality, in order to avoid that lecturers teach only from the point of view of their organisations
- The lecturers' teaching skills vary

## **9. + 10. Innovations and Best Practices / Plans for Future Changes**

The above concept has been tested, amplified and adjusted over the period of the last three years. The final basic structure of the lecture should be settled within one or two years.

## **11. Visitors' Comments**

The visitors understand that practice management is taught during the year of supervised experience in private practice

## Section 17: Examinations, Assessments and Competences

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### **Exams:**

The way to the Certification of Dentists in the Federal Republic of Germany is laid down by law valid for the whole Republic. This law exactly describes which practical and theoretical courses a student has to complete to get the application to enter the final examination (Dental Examination).

Within these rules the student has to absolve three official examinations:

1. *Natural Sciences Examination* (Subjects: Biology, Chemistry, Physics)
2. *Preliminary Dental Examination* (Subjects: Anatomy, Biochemistry, Physiology, Science of Dental Techniques and Dental Materials)
3. *Final Dental Examination* (Subjects: General and Oral Pathology; Pharmacology; Hygiene, Microbiology and Health Care; General and Internal Medicine; Dermatology and Venereal Diseases; Otolaryngology; Oral Medicine and Oral Surgery - including: Dental Radiology and Radiography, General Surgery, Maxillofacial Surgery -; Operative Dentistry - including Paediatric Dentistry, Preventive and Conservative Dentistry, Endodontics, Periodontology - ; Prosthodontics; Orthodontics).

All the theoretical exams are oral. There are no external examiners involved.

The examinations have to be absolved in the above sequence. After the *Final Dental Examination* the student can apply to the state authorities for the certificate enabling him/her to practise as a dentist.

### **Lectures and Courses:**

The following lectures *Natural Sciences Examination Scientific Preliminary Examination*:

- Lectures: One semester Biology, two semesters Chemistry and Physics
- Practical Courses: One semester Physics, one semester Chemistry

The following lectures and courses are required to get the permission to enter the *Preliminary Dental Examination*:

- Lectures: One semester Histology and Embryology, two semesters Physiology, two semesters Biochemistry, two semesters Dental Materials, three semesters Anatomy.
- Practical Courses: One semester Anatomy, one semester Biochemistry, one semester Physiology, one semester Histology, three semesters Science of Dental Techniques and Dental Materials.

The following lectures and courses are required to get the permission to enter the *Final Dental Examination*:

- Lectures: One semester General Oral Medicine, one semester General Pathology, one semester Oral Pathology, one Semester General Surgery, one semester Otolaryngology, one semester Hygiene, one semester Microbiology and Health Care, one semester History of Medicine, two semesters Pharmacology, two semesters General and Internal Medicine, two semesters Oral Medicine, two semesters Oral and Maxillofacial Surgery, two semesters Preventive Dentistry, Paediatric Dentistry, Conservative Dentistry, Endodontics and Periodontology, two semesters Prosthodontics, three semesters Orthodontics.
- Practical Courses: One semester Histopathology, one semester Clinical Chemistry, one semester Radiology and Radiography, one semester General Surgery, one semester Dermatology, one semester Preclinical Restorative Dentistry, one semester Preclinical Orthodontics, two semesters Oral and Maxillofacial Surgery, two semesters Clinical Orthodontics, two semesters Clinical Restorative Dentistry (including Preventive Dentistry, Paediatric Dentistry, Conservative Dentistry, Endodontics and Periodontology), two semesters Clinical Prosthodontics, three semesters Oral Medicine.

For each of the above mentioned lectures and courses the student receives a certificate. In this certificate the lecturer or the head of the department has to certify that the student attended the lectures or the courses regularly and successfully. Usually the student has a written or oral test to prove his theoretical knowledge. In the practical courses the student has to prove his ability and knowledge to solve certain exercises and problems.

#### **Strengths of the System:**

The law gives enough space to adjust the lectures and courses to scientific development. The training focuses on patient-treatment.

#### **Weaknesses of the System:**

Because all the exams are oral, no comparison of the quality of the training between the different universities is possible. The sequence of the courses in the law does not necessary changes. Other subjects, for example Psychology or Neurology, cannot be lectured.

#### **Plans for the Future:**

Several scientific and political societies have suggested a change concerning the examination regulations.

#### **Visitors' Comments**

- The final state board examination is subject to the same federal legislation as the curriculum. Discussions are ongoing to change the timing and it is anticipated that decision will be made in the near future. Before changes are made, the current balance between written and oral examinations should be reviewed.
- At present a student only has 2 opportunities to pass the final examination. A third attempt is desirable to ensure fairness.
- The school is to be complimented for the encouragement it gives to students to work towards a Doctor of Medical Dentistry before they graduate.
- Although external examiners are not used in Germany, the concept is worthy of further local consideration.
- Innovative assessment strategies were found for example in the orthodontic department where case analysis and case presentation are assessed individually.

## **Section 18: Other Influences**

### **18.1 Regional oral health needs**

The regional dental health care covers all types of dental treatment including oral and maxillofacial surgery. According to the data published by the KZVH (Association of dentists treating the patients in health insurance) in 1998 and 1999 only 38 % of all dentists in Hessen provide periodontal treatment. This is in contrast to the prevalence of periodontal diseases in our country.

A specialization in dentistry depends on the local state, i.e. in Hessen there is the possibility to specialize in orthodontics and oral surgery. Additional specialization in periodontics, endodontics, pedodontics would be beneficial, but still has not been organized by the local dental chamber.

#### **Visitors' Comments**

- There is very little teaching of Psychology, Behavioural Science, Ethics and Jurisprudence and Communication Skills. This deficiency should be addressed as part of Public Dental Health as soon as possible.
- Although a national dental survey has recently been carried out in Germany, a local oral health assessment would assist curriculum development.
- Prevention should be a priority early in the curriculum.

### **18.2 Evidenced-based-treatment**

Evidence-based diagnosis and treatment is taught in all clinical courses. Nevertheless the regulations of the health insurance companies limit the diagnostic and therapeutic possibility in the dental practice, i.e. the current treatment concept in periodontics is now 30 years old and has never been substantially updated.

In the different departments of our clinic controlled clinical trials are performed, e.g.: in the periodontal department about the efficiency of Emdogain proteins for guided tissue regeneration in furcation defects, in the prosthodontic department several multicenter randomized controlled clinical trials on alternative therapies as well as on the improvement of prostheses and on the influence of impression material.

#### **Visitors' Comments**

- The School clearly recognises the importance of Evidence Based Care and demonstrated willingness to translate it into the curriculum.

### **18.3 Student selection procedures**

In Germany student selection is based on their high school degree in the final examination. However, 20 % of all students are selected by the universities. In Giessen a committee of two professors selects new candidates based on a personal interview of at least 20 minutes.

#### **Visitors' Comments**

- Although the preclinical course identifies poor manual skills early, a mechanism should be found to exclude unsatisfactory students as early in the course as possible.

## Section 19: Student Affairs

### 19.1 Basic Data from Dental School

- a) average number of dental students qualifying per year: 50-60
- b) average number of dental students admitted to first year: 65
- c) Length of course in semesters: 10 semesters
- d) Is there a separate period of vocational training following graduation as a dentist in your country?  
YES
- e) If yes to d) above, is that organised by the University/Dental School? NO, it is controlled by the "Landeszahnärztekammer"(General Dental Council of Hessen)

### 19.2 List of Different Postgraduate Courses

Subject/Specialty	Degree Awarded	Length of Course	Annual Output
Postgraduate program in Orthodontics	Specialist*	3	2
Postgraduate program in Oral Surgery	Specialist*	3	1
Postgraduate program in Maxillo-Facial-Surgery	Specialist**	4	1
Advanced education in Prosthodontics	**	3	***
Advanced education in Periodontology	**	3	***
Advanced education in Pediatric dentistry	**	3	***
Advanced education in Endodontics	**	3	***
<hr/>			
* Specialist in Orthodontics, Oral Surgery or Maxillo-Facial-Surgery, respectively			
** Dentist with advanced education in Prosthodontics, Periodontology, Pediatric Dentistry or Endodontics, respectively			
*** Programs inaugurated 1/2000, no output rates available yet			

### 19.3 List of Different Auxillary/Technology/Other Courses

	Annual Output	Length of course (years)
a) dental nurses	9	2,5 - 3

### 19.4 Report of the Students' Representation (Fachschaft)

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#### Staff and Organization

Once a year all Giessen dental students elect a group of students' representatives executing the students' interests inside and outside the university committees.

Each student representative is in charge of a certain field:

- Students' spokesperson of the clinical part: Cand.med.dent. Martin Kerzendorf
- Vice spokesperson of the clinical part: Cand.med.dent. Christina Erbe
- Students' spokesperson of the pre-clinical part: Stud.med.dent. Niko Bock
- Vice spokesman of the pre-clinical part: Stud.med.dent Alexander Steiniger
- Editorial work and scripts: Cand.med.dent. Babett Williger
- Internship abroad (Local Exchange Officer): Cand.med.dent. Birgit Sengotta, Anja Heiß
- Internet delegate: Stud.med.dent Tobias Berndt
- Correspondence with dental firms: Cand.med.dent. Christina Erbe

- BdZM (Federal Association of Students of Dental Medicine in Germany ) delegate of the Giessen University Dental Hospital: Stud.med.dent. Niko Bock

### **Tasks of Students' Representatives**

The spokesperson or the vice-spokesperson of the clinical part and corresponding persons of the pre-clinical part are entitled to take part in the meetings of the University Dental Hospital Board. Generally the spokesperson of the clinical part is also a member of the students' representatives of the faculty board. At the beginning of each semester a plenary assembly of the dental students takes place. At this assembly the students' representatives inform the participants about their work and the current affairs concerning the students. This assembly is also the place where the student representatives are elected.

All the students' representatives take their job seriously because they know about the importance of a strong representation in the different committees.

It is feared that due to the general restrictions in economy the expenses of the students' training will be cut down first. It is, however, the students' opinion that the university dental hospital should be responsible for a modern training program. The dental students' representatives closely cooperate with those of human medicine when pursuing common interests.

### **Funds of student Representation**

The representatives do their job unpaid. However, each dental student is requested to pay a fee of 3,-DM (1,50 EUR) per semester in favor of the students' representation to purchase equipment like copying paper, office and laboratory supplies, etc. for the improvement for their working facilities.

Larger expenses are kindly paid by the dean's office. The work of the students' representatives profits from the dean's generous attitude towards the students.

### **Students' Financial situation**

Although the students are provided with an almost fully equipped workplace during all semesters they have to finance a substantial part of their studies themselves. During the last semesters the personal expenses of equipment have risen considerably, so each student has to contribute about 2500,-DM (approx. 1250,-EUR) to his/her own pre-clinical training and about 1300,-DM (approx. 650,- EUR) during his/her clinical training. Together with the University registration fee per semester (at this moment 189,-DM /approx. 95,-EUR) private expenses of about 550,-DM (approx. 225,-EUR) per student and semester have to be paid for, not mentioning books. This tendency is continuously rising. Many students are forced to work regularly in their free time because often their parents cannot afford complete financial support.

### **Dental Training from the Students' Perspective**

The dental training is restricted by Hessen's economic measures. Each department of the Giessen University Hospital has to cope with strong cuts among others in the salary budget. Despite these cuts the heads of the department have tried to fully guarantee the students' training and have developed corresponding training programs ensuring solid course management. However, most departments have reached the verge of their possibilities and would be unable to cope with further staff economic measures without severe consequences for the students' education. On the other hand, from the student's point of view a lower student to instructor ratio as well as a more frequent presence of professors would be desirable in the practical courses in order to reduce waiting time and increase treatment efficiency. The number of patients in the clinical courses has declined slightly thus forcing the students to recruit their own patients.

Due to a decree of court, the Giessen University Dental Hospital nowadays has to admit instead of 30 students to the first semester thus resulting in a shortage in the number of workplaces available. This may result in the fact that certain students are not admitted to the preclinical courses. The students consider themselves to be the ones who suffer when economic measures have to be carried out. They deeply regret:

- the dissolution of the department of Experimental Dentistry, having ensured the pre-clinical education in anatomy and biology
- the integration of the formally independent department of Oral Surgery into the department of Maxillofacial Surgery.

The students of the pre-clinical part sometimes feel as if they were given second-class treatment. Moreover they criticize the fact that there is too little distinction between the matters of dentistry and

human medicine because they have to do all the pre-clinical subjects together with the students of human medicine. The instructors of pre-clinical courses accept the problem without discussion and make every effort as to dental students; but feel incapable of offering explicit courses to dental students because of the tense financial situation. The students, however, tolerate these not optimal circumstances which cannot be changed much as the students would like to.

### **Students' Future Prospects**

The majority of the Giessen's dental students looks into the future optimistically despite the knowledge that professional conditions are worsening in Germany. Altogether and in spite of the tense financial situation they feel rather well educated at the Giessen University and are supplied with a solid knowledge for their job and future work.

### **Visitors' Comments**

The quality of students in Giessen is very high. During the visit their representatives participated whenever possible and their contributions were intelligent, well presented and constructive. A list of the strength and weaknesses in the course as perceived by the students is set out below for information.

Strengths as perceived by students:

- low study fees compared to other German Universities
- the pre-clinical courses are well organized
- nearly fully equipped workplaces for the students
- many different departments (e.g. Endodontics, Periodontology)
- seminars held for small group of students in the Department of Orthodontics
- good assessment-system in Periodontology and Conservative Dentistry
- variety of new dental products and materials are being tested in the Department of Prosthodontics
- the professors assess the intermediate steps of student work in the courses of Prosthodontics
- paid general dental emergency service for students
- student representatives are member of the dental school-directorate

Weaknesses as perceived by students:

- students are the first to suffer from financial restraints
- not enough staff for supervision
- pre-clinical lectures overlap
- no internal evaluation of dental training
- discrepancy between scientific research and dental training
- lack of patients
- no common room for dental students
- no separate course for dental students in the pre-clinical section in general medicine subjects
- lack of communication between the departments
- dental industry is not involved in dental training
- no sufficient surgical training (e.g. osteotomy of third molars)
- no exchange programme organized by the dental school

Many of the issues identified are reviewed elsewhere but the visitors would like to draw attention to the following points:

- The student pairing system works well but could be improved if it was organized according to students ability, e.g. strong with weak rather than student choice
- Despite the pressure on space a common room should be provided as soon as possible. The students intend to present a case to the Faculty Board which should be supported by the School
- The need for a transparent continuous assessment in the phantom head course, which precedes the clinical course. This would allow staff and students to identify their strength and weaknesses at an early stage
- The lack of teaching in internal medicine although the law requires instructions before the final examination
- A perception that some of the gradings in the clinical points system were unfair because they reflected the difficulty of the procedures and not the time taken and the number of patient visit.
- CPR training is currently organized by the students themselves. This should be an integral part of the curriculum

- Closure of the technical laboratories at 5 p.m. restricts the opportunities for students to process their work
- Opportunities to participate in student exchange programmes should be provided.
- A fondation should be created to act as an Alumnus and as a source of funds for the School.

## **Section 20: Research and Publications of the Dental School (1997-1999)**

- 20.1 Publications in Refereed Journals
- 20.2 Textbooks published by staff
- 20.3 Chapters in Books
- 20.4 Grants received
- 20.5 Invited presentations at international meetings
- 20.6 Higher degrees awarded
- 20.7 Scientific awards

### **Orthodontics**

Representative: Prof. Dr. H. Pancherz  
 e-mail:hans.pancherz@dentist.med.uni-giessen.de

- 20.1: 21
- 20.2: 0
- 20.3: 2
- 20.4: 2
- 20.5: 12
- 20.6: 9
- 20.7: 3

### **20.1 Publications in Refereed Journals**

Ruf, S., Cecere, F., Kupfer, J., Pancherz, H.  
 Stress-induced changes in the functional electromyographic activity of the masticatory muscles.  
*Acta Odontol Scand.* 55: 44-48, 1997

Pancherz, H., Zieber, K., Hoyer, B.  
 Cephalometric Characteristics of Class II division 1 and Class II division 2 malocclusions: A comparative study in children.  
*Angle Orthod.* 67: 111-119, 1997

Ömblus, J., Malmgren, O., Pancherz, H., Hägg, U., Hansen, K.  
 Long-term effects of Class II correction in Herbst and Bass therapy.  
*Eur. J. Orthod.* 19: 185-193, 1997

Konik, M., Pancherz, H., Hansen, K.  
 The mechanism of Class II correction in "late" Herbst treatment.  
*Am. J. Orthod. Dentofac. Orthop.* 112: 87-91, 1997

Hansen, K., Koutsonas, T.G., Pancherz, H.  
 Long-term effects of Herbst treatment on the mandibular incisor segment: A cephalometric and biometric investigation.  
*Am. J. Orthod. Dentofac. Orthop.* 112: 92-104, 1997

Ruf, S., Pancherz, H.  
 The mechanism of Class II correction during Herbst therapy in relation to vertical jaw relationship: A cephalometric roentgenographic study.  
*Angle Orthod.* 67: 271-276, 1997

Obijou, C., Pancherz, H.  
 Herbst appliance treatment of Class II division 2 malocclusions.  
*Am. J. Orthod. Dentofac. Orthop.* 112: 287-291, 1997

- Panzerz, H.  
The effects, limitations and long-term dentofacial adaptations to treatment with the Herbst appliance.  
Seminars in Orthodontics 3: 232-243, 1997
- Ruf, S., Hansen, S., Panzerz, H.  
Does orthodontic proclination of lower incisors in children and adolescents cause gingival recession?  
Am. J. Orthod. Dentofac. Orthop. 114: 100-106, 1998
- Ruf, S., Panzerz, H.  
Temporomandibular joint growth adaptation in Herbst treatment: a prospective magnetic resonance imaging and cephalometric roentgenographic study.  
Eur. J. Orthod. 20: 375-388, 1998. (*Recipient of the W.J.B. Houston Oral Research Award*)
- Panzerz, H., Zieber, K.  
Dentoskeletal Morphology in Children with Deckbiss  
J. Orofac. Orthop. 59: 274-285, 1998
- Panzerz, H., Ruf, S., Kohlhas, P.  
"Effective condylar growth" and chin position changes in Herbst treatment.  
A cephalometric roentgenographic long-term study.  
Am. J. Orthod. Dentofac. Orthop. 114: 437-446, 1998
- Ruf, S., Panzerz, H.  
Long-term TMJ effects of Herbst treatment: A clinical and MRI study.  
Am. J. Orthod. Dentofac. Orthop. 114: 475-483, 1998
- Störmer, K., Panzerz, H.  
Elektromyographische Untersuchung der perioralen Muskulatur und Kaumuskulatur bei kieferorthopädischen Patienten mit Atypischen Schluckmuster.  
Fortschr. Kieferorthop. 60: 13-23, 1999
- Betzenberger, D., Ruf, S., Panzerz, H.  
The compensatory mechanism in high-angle malocclusions: A comparison of subjects in the mixed and permanent dentition.  
Angle Orthodont. 69: 27-32, 1999
- Ruf, S., Panzerz, H.  
Dentoskeletal effects and facial profile changes in young adults treated with the Herbst appliance.  
Angle Orthod. 69: 239-246, 1999
- Ruf, S., Panzerz, H.  
Temporomandibular joint remodeling in adolescents and young adults during Herbst treatment: A prospective longitudinal magnetic resonance imaging and cephalometric radiographic investigation.  
Am. J. Orthod. Dentofac. Orthop. 115: 607-618, 1999
- Panzerz, H., Ruf, S., Thomalske-Faubert, Ch.  
Mandibular articular disk position changes during Herbst treatment: A prospective longitudinal MRI study.  
Am. J. Orthod. Dentofac. Orthop. 116: 207-214, 1999
- Ruf, S., Panzerz, H.  
Class II division 2 malocclusion: Genetics or environment? A case report of monozygotic twins.  
Angle Orthod. 69: 321-324, 1999
- Panzerz, H., Schäffer, C.  
Individual-Based Prediction of the Size of the Supporting Zones in the Permanent Dentition. A Comparison of the Moyers Method with a Unitary Value.  
J. Orofac. Orthop. 60: 227-235, 1999
- Hering, K., Ruf, S., Panzerz, H.  
Orthodontic treatment of openbite and deepbite high-angle malocclusions  
Angle Orthod. 69: 470-477, 1999

## 20.3 Chapters in Books

Pancherz, H.  
The Modern Herbst Appliance  
In "Dentofacial Orthopedics with Functional Appliances. 2<sup>nd</sup> Edition  
Eds.: Thomas M. Gruber, Thomas Rakosi and Alexandre G. Petrovic  
Mosby Company, St. Louise 1997

Pancherz, H.  
The "high-angle" orthodontic patient.  
In Orthodontic Management of Facial Height, Long Face and Short Face.  
Neuer Merkur, München 1999

## 20.4 Grants received

€5.700 Prof. Pancherz/A. Gebhardt  
DFG-Grant for growth research

€1.825 Dr. S. Ruf  
DFG-Travel-Grant

## 20.5 Invited presentations at international meetings

Pancherz, H.  
The effect of the Herbst appliance on the TMJ.  
97<sup>th</sup> Annual Session of the American Association of Orthodontists  
Philadelphia / USA 03.05. - 07.05.1997

Ruf, S., Pancherz, H.  
Anterior disc displacement therapy with the Herbst appliance.  
97<sup>th</sup> Annual Session of the American Association of Orthodontists.  
Philadelphia / USA 03.05. - 07.05.1997

Pancherz H.  
The "high-angle" orthodontic patient.  
The 11<sup>th</sup> International Congress for Orthodontists  
Munich 30.10 - 01.11.1997

Pancherz, H.  
The Herbst appliance - Its scientific background and clinical use  
Beijing International Congress on Orthodontics  
Beijing / China 01.11. - 02.11. 1997

Ruf, S., Pancherz, H.  
TMJ Growth Adaptation in Young Adults Treated with the Herbst Appliance. A Prospective MRI and  
Cephalometric Roentgenographic Study.  
Beijing International Congress on Orthodontics  
Beijing / China 01-11. - 02.11.1997

Pancherz, H.  
Management of skeletal Class II malocclusions with the Herbst appliance  
1997 Thailand International Orthodontic Congress  
Bangkok / Thailand 10.12. - 12.12.1997

Pancherz, H.  
Dentofacial orthopedics with the Herbst appliance  
5<sup>th</sup> International Symposium of Orthodontics  
Athens / Greece 14.03. - 15.03.1998

Pancherz, H.  
Clinical use of the Herbst appliance.  
13<sup>th</sup> British Orthodontic Conference  
Torquay / England 27.09. - 30.09.1998

Pancherz, H.  
Efficiency of the Herbst appliance with special reference to treatment timing.  
13<sup>th</sup> British Orthodontic Conference  
Torquay / England 27.09. - 30.09.1998

Pancherz, H.  
Early or Late Herbst Treatment - Does It Matter?  
99<sup>th</sup> Annual Session of the American Association of Orthodontics  
San Diego / USA 14.05. - 18.05.1999

Ruf, S.  
TMJ Growth Adaptation in Young Adults Treated with the Herbst Appliance.  
97. Jahrestagung der American Association of Orthodontics  
San Diego / USA 14.05. - 18.05.1999

Pancherz, H.  
The effect of the Herbst appliance on the temporomandibular joint.  
6<sup>th</sup> International Symposium of the Turkish Orthodontic Society.  
Ankara / Turkey 12.11. - 13.11.1999

## 20.6 Higher degrees awarded (Dr. med. dent.)

Hoyer, Britta-Ulrike  
Die dentoskelettale Morphologie bei Dysgnathien der Angle Klasse II:1  
Supervisor: Prof. Dr. H. Pancherz

Kohlhas, Peter  
"Effektive" Kiefergelenks- und Kinnveränderungen bei der Herbst-Behandlung. Eine  
röntgenkephalometrische Langzeitstudie.  
Supervisor: Prof. Dr. H. Pancherz

Schäffer, Carmen  
Individuelle Stützzonenbreitenbestimmung im bleibenden Gebiss. Vergleich gängiger  
Prognosemethoden mit einem "Normwert"  
Supervisor: Prof. Dr. H. Pancherz

Thomalske-Faubert, Christine  
Auswirkungen der Herbst-Behandlungen auf den Diskus-Kondylus-Komplex des Kiefergelenkes. Eine  
prospektive longitudinale magnetresonanztomographische Studie.  
Supervisor: Prof. Dr. H. Pancherz

Braun, Annette  
Bissanomalien, Habits und Karies im Milch- und frühen Wechselgebiss.  
Supervisor: Prof. Dr. H. Pancherz

Mayer, Claudia  
Beziehung zwischen dentoskelettaler Morphologie und Aktivität der Kaumuskulatur.  
Eine röntgenkephalometrische und elektromyographische Studie.  
Supervisor: Prof. Dr. H. Pancherz

Baltromejus, Sandra  
"Effektive" Kiefergelenks- und Kinnveränderungen bei der Aktivatorbehandlung. Eine  
röntgenkephalometrische Untersuchung.  
Supervisor: Dr. S. Ruf / Prof. Dr. H. Pancherz

Al-Borney, Majed

Verwendung des Fernröntgenseitenbildes des Kopfes und des Orthopantomogramms zur metrischen Analyse des Schädels in der Kieferorthopädie. Eine vergleichende Studie.

Supervisor: Dr. S. Ruf / Prof. Dr. H. Pancherz

Boßhammer-Junk, Barbara

Bestimmung der skeletalen Reife mittels Handröntgen und Sonographie. Eine Reliabilitäts- und Validitätsuntersuchung

Supervisor: Prof. Dr. H. Pancherz

## 20.7 Scientific Awards

Dr. S. Ruf

Recipient of the WJB Houston Research Award at the Annual Session of the Orthodontic Society in Valencia 1997. Title of the paper: "Temporomandibular joint adaptation in Herbst treatment. A prospective MRI and cephalometric roentgenographic study" (Authors: Ruf , S., Pancherz, H.).

Dr. S. Ruf

Recipient of the Sixth SIDO World Award at the 14<sup>th</sup> S.I.D.O. Congress-International in Venice 1997. Title of the paper: "TMJ growth adaptation in young adults treated with the Herbst appliance" (Authors: Ruf, S., Pancherz, H.).

Dr. C. Thomalske-Faubert

Recipient of the best thesis award 1998 founded by the „Zahnärztliche Verein zu Frankfurt am Main von 1863 e.V.“

Title of the thesis: Auswirkungen der Herbst-Behandlungen auf den Diskus-Kondylus-Komplex des Kiefergelenkes. Eine prospektive longitudinale magnetresonanztomographische Studie.

## Conservative Dentistry and Endodontics

Representatives:

Prof. Dr. Joachim Klimek

e-mail: joachim.klimek@dentist.med.uni-giessen.de

Prof. Dr. C. Koçkapan

e-mail: cengiz.kockapan@dentist.med.uni-giessen.de

20.1: 14

20.2: 2

20.3: 4

20.4: 4

20.5: 2

20.6: 11

20.7: 0

## 20.1 Publications in Refereed Journals

Jung, M.

Surface roughness and cutting efficiency of composite finishing instruments.

Oper Dent 22: 98-104, 1997

Klimek, J., Jung, M., Jung, S.

Interindividual differences in degradation of sodium monofluoro-phosphate by saliva in relation to oral health status.

Archs oral Biol 42: 181-184, 1997

- Jung, M., Baumstieger, M., Klimek, J.  
Efficiency of diamond-impregnated felt wheels for polishing a hybrid composite.  
Clin Oral Invest 1: 71-76, 1997
- Ganss, C., Reinhardt, K., Klimek, J.  
Der Einfluss einer Vitalbleichung mit Carbamidperoxid auf die Entstehung künstlicher initialer Kariesläsionen und Schmelzerosionen.  
Dtsch Zahnärztl Z 52: 597-599, 1997
- Jung M., Ganss, C., Senger, S.  
Effect of Eugenol-containing temporary cements on bond strength of composite to enamel.  
Oper Dent 23: 63-68, 1998
- Ganss, C., Jung, M.  
Effect of eugenol containing temporary cements on bond strength of composite to dentin.  
Oper Dent 23: 55-62, 1998
- Redlich, E., Koçkapan, C.  
Scanning electron microscopic study of regular and supernumerary root canals in human teeth.  
Int Endod J 31: 210-211, 1998
- Klimek, J., Ganss, C., Schwan, P., Schmidt, R.  
Fluoridaufnahme im Zahnschmelz nach Anwendung von NaF- und AmF-Zahnpasten – Eine in-situ-Studie.  
Oralprophylaxe 20: 192-196, 1998
- Jung, M., Wehlen, L.O., Klimek, J.  
Surface roughness and bond strength of enamel to composite.  
Dent Mater 15: 250-256, 1999
- Ganss, C., Schlechtriemen, M., Klimek, J.  
Dental erosions in subjects living on a raw food diet.  
Caries Res. 33: 74-80, 1999
- Klimek, J., Tussing, F., Ganss, C.  
Effekt einer AmF/SnF<sub>2</sub>-haltigen Mundspülösung auf das Säurebildungsvermögen von Plaque.  
Oralprophylaxe 21: 82-85, 1999
- Ganss, C., Klimek, J., Gleim, A.  
Qualität von Fissurenversiegelungen mit zwei fluoridfreisetzen Versieglermaterialien. Dtsch Zahnärztl Z 54: 108-111, 1999
- Klimek, J., Ganss, C., Alffen, T.  
Kariesbefall, Restaurationsarten und Fissurenversiegelungen bei deutschen Rekruten in den Jahren 1992 und 1996.  
Dtsch Zahnärztl Z 54: 317-320, 1999
- Ganss, C., Klimek, J., Gleim, A.  
One year clinical evaluation of the retention and quality of two fluoride releasing sealants.  
Clin Oral Invest 3: 188-193, 1999.

## 20.2 Textbooks published by staff

Koçkapan, C.: Endodontie, 2<sup>nd</sup> edition. J. F. Lehmanns Fachbuchhandlung, Giessen 1998.

Hellwig, E., Klimek, J., Attin, T.: Einführung in die Zahnerhaltung. 2. Auflage. Urban und Fischer, München 1999.

## 20.3 Chapters in Books

- Klimek, J.: Initiale Karies und ihre Behandlung  
Deutscher Zahnärzte Kalender 1997, S. 23-42, Carl Hanser Verlag, München 1996.
- Klimek, J., Hellwig, E.: Kariesätiologie und -diagnose. In: Heidemann, D. (Hrsg.), Praxis der Zahnheilkunde Band 2. Kariologie und Füllungstherapie. Urban und Schwarzenberg, München 1998.
- Hellwig, E., Klimek, J.: Epidemiologie der Karies. In: Heidemann, D. (Hrsg.), Praxis der Zahnheilkunde Band 2. Kariologie und Füllungstherapie. Urban und Schwarzenberg, München 1998.
- Jung, M.: Digitales Röntgen. In: Koçapan, C.: Endodontie. 2. Auflage. J. F. Lehmanns Fachbuchhandlung, Giessen 1998.

## 20.4 Grants received

Year: 1997-1999  
Source: Deutsche Forschungsgemeinschaft  
Theme: Dental erosion  
Amount: 70.000,- €

Year: 1996-1999  
Source: Industrial  
Theme: Fluoride toothpaste and mouthrinses  
Amount: 15.000,- €

Year: 1997  
Source: Industrial  
Theme: Fluoride sealants  
Amount: 3.000,- €

Year: 1998-1999  
Source: Industrial  
Theme: Fluoride Gel  
Amount: 40.000,- €

## 20.5 Invited presentations at international meetings

Klimek, J.  
Plaque removal in caries disease. The 6<sup>th</sup> Symposium of Preventive Dentistry. Oral Health of Young Generation and Preventive Programs in Action. 20.-21.11.1998 in Prague, Czech Republic.

Klimek, J.  
The role of plaque removal. Symposium: Current Caries Preventive Measures. 24.04.1998 in Kosice, Slovakia.

## 20.6 Higher degrees awarded

### 20.6.1 Dissertationen (Dr. med. dent.)

Wagner, Rainer  
Akzeptanz und Effektivität der Individualprophylaxe in der Zahnärztlichen Praxis.  
Supervisor: Prof. Dr. J. Klimek

Melcher, D.  
Stabilität lokal applizierten Fluorids im Dentin menschlicher Zähne unter Einfluss des Mundhöhlenmilieus.  
Supervisor: Prof. Dr. J. Klimek

Schlechtriemen, M.

Untersuchung zur Mundgesundheit von Rohköstlern unter besonderer Berücksichtigung der dentalen Erosionen.

Supervisor : Prof. Dr. J. Klimek

Braun, M.

Bestimmung des erosiven Mineralverlustes im Zahnschmelz: Ein Methodenvergleich von longitudinaler Mikroradiographie und Profilometrie.

Supervisor: Prof. Dr. J. Klimek

Jochim, A.

Rasterelektronenmikroskopische und experimentelle Untersuchungen über die Frakturen von Kofferdamklammern.

Supervisor: Prof. Dr. C. Koçkapan

Müller-Lessmann, V. R.

Oberflächenuntersuchungen an Goldhämmerfüllungen unter Berücksichtigung verschiedener Goldsorten und Poliermethoden.

Supervisor: Prof. Dr. C. Koçkapan

Redlich, E.

Rasterelektronenmikroskopische Untersuchungen an regulären und überzähligen Wurzelkanälen menschlicher Zähne.

Supervisor: Prof. Dr. C. Koçkapan

Wehlen, L.O.

Untersuchungen zum Einfluß verschiedener Oberflächengeometrien auf den Schmelz-Kompositverbund.

Supervisor: Prof. Dr. J. Klimek

Schweitzer, M.

Schützt Speichel vor Erosionen? Eine in-vitro-Untersuchung zur Löslichkeit von menschlichem Zahnschmelz in zwei unterschiedlich charakterisierten diätetischen Säuren.

Supervisor: Prof. Dr. J. Klimek

Bünker, H.

In-situ-Untersuchung zur kariesprotektiven Wirkung fluoridfreisetzender Füllungsmaterialien.

Supervisor: Prof. Dr. J. Klimek

## 20.6.2 Habilitationen (Ph.D.)

Jung, M.

Ausarbeitung und Politur von laborgefertigten Keramik- und Kompositinlays in-vitro und in-vivo.

Habilitationsschrift

Habilitation procedure finished 12.07.1999.

## Periodontology

Representative: Prof. Dr. Joerg Meyle

e-mail: joerg.meyle@dentist.med.uni-giessen.de

20.1: 6

20.2: 0

20.3: 3

20.4: 6

20.5: 6

20.6: 0

20.7: 3

## 20.1. Publications in Referred Journals

T.C. Hart, A. Stabholz, J. Meyle, L. Shapira, T.E. Van Dyke, C.W. Cutler, W.A. Soskolne  
 Genetic studies of syndromes with severe periodontitis and palmoplantar hyperkeratosis  
 J Periodont Res 32: 81-89, 1997

J. Meyle  
 Diagnostische Tests in der Parodontologie  
 Dtsch Zahnärztl Z 54: 73 – 77, 1999

J. Meyle, D. Axmann-Krcmar  
 Regression coefficient analysis of neutrophil chemotaxis in periodontitis  
 Oral Microbiol Immunol 14: 127 – 135, 1999

J. Meyle, K. Gültig, G. Rascher, H. Wolburg  
 Transepithelial electrical resistance and tight junctions of human gingival keratinocytes  
 J Periodont Res 34: 214 – 222, 1999

J. R. González, J. M. Herrmann, A. Kleinstuber, J. Vonholdt, J. Meyle  
 Einfluß einer Ölspülung auf die lokale Entzündungsreaktion bei adulter Parodontitis - Erste Ergebnisse  
 Dtsch Zahnärztl Z 54: 499-502, 1999

J. R. González, J. M. Herrmann, A. Schürmann, J. Vonholdt, J. Meyle  
 Elektronische Parodontitisdiagnostik  
 Parodontologie 10 339-356, 1999

## 20.3. Chapters in Books

J. Meyle  
 Indizes  
 D. Heidemann (Ed.)  
 Praxis der Zahnheilkunde Band 4 "Parodontologie"  
 Urban & Schwarzenberg, München, Wien, Baltimore 1997

J. Meyle  
 The role of neutrophils in periodontal inflammation  
 S. Mutlu, S. Porter, S. Yilmaz, C. Scully (Eds.)  
 New horizons in Periodontology  
 Science Reviews, Northwood, Middlesex 1998

J. Meyle  
 Cell adhesion and spreading on different implant surfaces  
 N.P. Lang, T.. Karring, J. Lindhe (Eds.) Proceedings on the 3<sup>rd</sup> European Workshop on Periodontology  
 – Implant Dentistry  
 Quintessence, Berlin 1999

## 20.4. Grants received

1997:  
 Soft tissue adhesion to implant materials  
 Industrial Grant € 50000,-

1998:  
 Soft tissue adhesion to implant materials  
 Industrial Grant € 50000,-

Effects of retinoids on experimental gingivitis  
 Industrial Grant € 30000,-

1999:  
Effects of retinoids on experimental gingivitis  
Industrial Grant € 30000,-

Epithelial barrier and cellular contacts  
Industrial Grant € 90000,-

Effect of Emdogain on periodontal regeneration  
Industrial Grant € 10000,-

## 20.5. Invited presentations at international meetings

J. Meyle  
Scientific basis of peri-implant soft tissue management  
7th International FRIATEC-Symposium, Frankfurt, April

J. Meyle, R. Roessler, I. Jacobi  
Microtopography and soft tissue architecture  
Europerio 2, Florence, May

J. Meyle  
Frialit-2 implants for single tooth replacement  
28<sup>th</sup> Annual Meeting Turkish Society of Periodontology, Ankara, May , 1998

J. Meyle  
Frialit-2 implants for single tooth replacement  
8<sup>th</sup> Annual Meeting Turkish Society of Implantology, Antalya, June, 1998

J. Meyle  
Reconstruction of alveolar bone defects with bone substitute materials  
Tagung im Zentrum für Zahn-, Mund- u. Kieferheilkunde der Université Clairmont-Ferrand, September, 1998

J. Meyle  
Implant surface and osseointegration  
"New Trends in Implantology" Refreshing course of the Italian Society of Periodontology, Milano, September, 1998

## 20.7. Scientific Awards

J.M. Hermann, A. Kleinstuber, J.R. Gonzalez, J. Vonholdt, E. Panagiotou, R. Roessler, J. Meyle  
Mikrotest zur Bestimmung der Elastaseaktivität bei marginaler Parodontitis  
Award for Best Poster at the DGP-Annual Meeting, Dresden, 1997.

J.R. Gonzalez, J.M. Herrmann, A. Kleinstuber, R. Roessler, J. Meyle  
Award for Best Poster  
Genetischer Polymorphismus in adulter Parodontitis (AP) – Identifikation eines Genotyps  
Award for Best Poster at the Europäisches Forum Zahnmedizin, Frankfurt am Main, 1997

J.R. Gonzalez, J.M. Herrmann, A. Kleinstuber, J. Vonholdt, J. Meyle  
Award for Best Poster  
Einfluß einer Sojaölspülung auf die Entzündungsreaktion bei marginaler Parodontitis (AP)  
Award for Best Poster at the DGP-Annual Meeting, Würzburg, 1999.

**Prosthodontics**

Representative: Prof. Dr. Paul Ferger

e-mail: Paul.Ferger@dentist.med.uni-.giessen.de

20.1: 8

20.2: 0

20.3: 8

20.4: 0

20.5: 0

20.6: 0

20.7: 7

**20.1 Publications in Refereed Journals**

Wefers, K.-P.

Behandlungen außerhalb der Praxis im Meinungsbild der Helferinnen. Swiss Dent 18, 16-18 (1997)

Wöstmann, B.

Tragedauer von Einstückgußprothesen im überwachten Gebrauch. Dtsch Zahnärztl Z 52, 100-104 (1997)

Wöstmann, B., Hufnagel, A.

Vergleich verschiedener Methoden zur Bestimmung der Randschlüssegenauigkeit von Kronen in vivo. Dtsch Zahnärztl Z 52, 272-274 (1997)

Wöstmann, B., Wickop, H., Kolb, G., Ferger, P.

Zahnärztlich-geriatrisches Assessment zur objektiven Einschätzung der zahnärztlich-prothetischen Versorgung und des Ernährungszustandes älterer Patienten. Geriat Forsch 7 (Suppl 1), 112-113 (1997)

Wöstmann, B., Höing, M., Ferger, P.

Vergleich der mit hand- und maschinengemischten (Pentamix-System) Abformmassen erreichten Abformgenauigkeit in-vitro und in-vivo. Dtsch Zahnärztl Z 53, 753-756 (1998)

Wickop, H., Wöstmann, B., Ferger, P., Kolb, G.

Ernährungszustand und zahnärztlich-prothetische Versorgung älterer Patienten. Swiss Dent 19, (12) 5-7 (1998)

Wöstmann, B., Koniaris, A., Ferger, P.

Der Einfluß von Feuchtigkeit auf die Abformgenauigkeit in einem Sulkus-Fluid-Flow Modell. Dtsch Zahnärztl Z 54, 631-633 (1999)

Wöstmann, B., Symeonidis, A., Ferger, P.

Abformgenauigkeit und Lagerungsstabilität moderner C-Silkone. Dtsch Zahnärztl Z 54, 634-636 (1999)

**20.3 Chapters in Books**

Johnke, G., Wefers, K.-P.

Ältere Menschen. In: Bauch, J. (Ed.): Prophylaxe ein Leben lang - ein lebensbegleitendes oralprophylaktisches Betreuungskonzept. Deutscher Ärzteverlag, 2. Aufl., S. 97-112. Köln (1997)

Wöstmann, B.

Gibt es zahnärztliche Befunde, bei deren Vorliegen vermehrt an eine psychosomatische Störung gedacht werden muß? In: Sergl, H.G. (Ed.): Jahrbuch der Psychologie und der Psychosomatik in der Zahnheilkunde, Bd. 5., Hänsel-Hohenhausen (1997)

Wöstmann, B.

Psychagogische Aspekte bei der zahnärztlichen Betreuung des alten Menschen. In: Sergl, H.G. (Ed.): Jahrbuch der Psychologie und der Psychosomatik in der Zahnheilkunde, Bd. 5., Hänsel-Hohenhausen (1997)

Wöstmann, B., Raschke, K. R.

Prothesenunverträglichkeit bei kiefer-gesichts-versehrten Patienten nach Tumoroperationen. In: Reitemeier, G. u. Penkner, K. (Eds.): Fortschritte in der Chirurgischen Prothetik und Epithetik, Bd. VII., Linz (1997)

Wöstmann, B.

Abformmaterialien. In: H. Meiners, K. M. Lehmann (Eds.): Klinische Werkstoffkunde. Hanser, München (1998)

Wöstmann, B.

Abformung und Modellherstellung. In: B. Koeck (Ed.): Praxis der Zahnheilkunde Bd. 5, Festsitzender Zahnersatz. Urban & Schwarzenberg, München (1999)

Wöstmann, B.

Psychisch bedingte Behandlungsprobleme. In: P. Ferger (Ed.): Kompromisse und Grenzen der Zahnärztlichen Behandlung. Spitta, Balingen (1999)

Ferger, P.: Kompromisse und Grenzen der Zahnärztlichen Behandlung (Ed.: P. Ferger), Spitta, Balingen (1999)

## 20.6 Higher degrees awarded (Dr. med. dent.)

Jung, Peter

Epidemiologische Studie zum Gebisserkrankungszustand bei erwachsenen Asylbewerbern im Landkreis Gießen. Prothetische Versorgung und Oralhygiene.

Supervisor: Prof. Dr. P. Ferger

Lauber, Petra

Der Nachsorgebedarf totaler Prothesen  
Supervisor: Prof. Dr. P. Ferger

Bethke, Rudolf

Zur Gelenkbahnbestimmung des menschlichen Kiefergelenkes durch den Vergleich intraoraler Positionsregister und dem SAS-System nach Meyer/dal Ri.

Supervisor: Prof. Dr. P. Ferger

Hardt, Heiko

Experimentelle Untersuchungen zur Rauigkeit lackierter Prothesenoberflächen.

Supervisor: Prof. Dr. P. Ferger

Koniaris, Athanasios

Vergleich von derzeit gebräuchlichen Abformmaterialien und -techniken mit Hilfe eines Sulkus-Fluid-Modells.

Supervisor: Prof. Dr. P. Ferger

Lang, Katharina

Zur zahnmedizinischen Versorgung von Langzeitpatienten in Allgemeinkrankenhäusern im Wetteraukreis.

Supervisor: Prof. Dr. P. Ferger

Pfütz, Ivo

Gebisserkrankung und Gebissanierung bei Wehrpflichtigen der deutschen Bundeswehr unter besonderer Berücksichtigung der prothetischen Versorgung.

Supervisor: Prof. Dr. P. Ferger

## 20.7 Scientific Awards

Award for the best Poster at the „49. Jahrestagung der Deutschen Gesellschaft für Prothetik und Werkstoffkunde“, 1999.

Award for the best Poster at the „2. Internationaler Geriatriekongreß“, 1999.

### **Preclinical Section**

Representative: Prof. Dr. Rosemarie Ritter-Horn

Phone: 0049 641 9946250

Fax: 0049 641 9946249

20.1: 0

20.2: 0

20.3: 0

20.4: 0

20.5: 0

20.6: 0

20.7: 0

The staff of this department is doing research in other departments. Their publications are listed there.

### **F. Child Dental Health (Paediatric Dentistry)**

Representative: Prof. Dr. W.-E. Wetzel

e-mail: Willi-Eckhard.Wetzel@dentist.med.uni-giessen.de

20.1: 14

20.2: 1

20.3: 6

20.4: 0

20.5: 1

20.6: 5

20.7: 2

## 20.1 Publications in Refereed Journals

Wetzel, W.-E.

Beeinflussung des Zahnschmelzes durch Antibiotika.

Pädiat Prax 52: 123-128, 1997

Boemans, B., Lorbeer, J., Wetzel, W.-E.

Häufigkeit der Milchzahnkaries bei Kleinkindern.

Oralprophylaxe 19: 133-139, 1997

Behrendt, A., Vahrson, K., Wetzel, W.-E.

Consequences of serious oral injury associated with the congenital analgia syndrome.

J Dent Child 64: 264-266, 1997

Wetzel, W.-E.

Fissurenversiegelung als kariesprophylaktische Maßnahme.

Pädiat Prax 53: 317-321, 1997/98

Wetzel, W.-E., Böhmer, C., Sziegoleit, A.  
In-Vitro-Karies durch Candida albicans.  
Acta Med Dent Helv 2: 308-313, 1997

Behrendt, A., Knoblauch, B., Schlechtriemen, M., Wetzel, W.-E.  
Problematische Begleitbefunde beim Nursing-bottle-Syndrom.  
Monatsschr Kinderheilkd 136: 30-36, 1998

Lorbeer, J., Boemans, B., Wetzel, W.-E.  
Karieshäufigkeit bei Kindergartenkindern - Ein Vergleich der Werte für 1986 und 1996 in Mittelhessen.  
Oralprophylaxe 20: 95-100: 1998

Petersen, K., Wetzel, W.-E.  
Recent findings in classification of osteogenesis imperfecta by means of existing dental symptoms.  
J Dent Child 65: 305-309, 1998

Behrendt, A., Wetzel, W.-E.  
Häufigkeit der Reeruption von intrudierten Milchschnidezähnen bei Kleinkindern.  
Dtsch Zahnärztl Z 53: 849-853, 1998

Behrendt, A.  
Kariesprophylaxe mit Fluoriden.  
Pädiat Prax 55: 221-227, 1998/99

Wetzel, W.-E., Boemans, B., Lorbeer, J.  
Fluoridierung: Kooperation Zahnarzt und Kinderarzt.  
Oralprophylaxe 21 (Supplement): 40-43, 1999

Zakipour, H., Wetzel, W.-E.  
Freisetzung von Maltose/Maltotriose und Glucose aus Maltodextrinen und matodextrinhaltigen  
Kindertees unter Einfluss von  $\alpha$ -Amylase und Speichel.  
Acta Med Dent Helv 4: 95-101, 1999

Behrendt, A., Sziegoleit, F., Wetzel, W.-E.  
Nursing-Bottle-Syndrom bei verlängerter Trinkzufuhr aus Schnabelgefäßen.  
Oralprophylaxe 21: 144-147, 1999

Sziegoleit, F., Sziegoleit, A., Wetzel, W.-E.  
Effect of dental treatment and/or local application of amphotericin B to carious teeth on oral  
colonization by Candida.  
Med Mycol 37: 345-350, 1999

## 20.2 Textbooks published by staff

Wetzel, W.-E.  
Zahn- und Mundbefunde bei Osteogenesis imperfecta.  
Deutsche Gesellschaft für Osteogenesis imperfecta Betroffene e.V. (Eds.): Mühlheim a.M. 1998.  
ISBN 3-932732-01-4

## 20.3 Chapters in Books

Wetzel, W.-E.  
Kariesprophylaxe bei Kleinkindern. In: G.Rössler, W.Kirch (Eds.): Public Health und Zahngesundheit.  
Roderer, Regensburg. S. 51-57, 1997.

Wetzel, W.-E.  
Einfluß des Stillens auf die Zahn- und Mundgesundheit. In: Gesunde Kinder - (K)ein Problem.  
Verband für Unabhängige Gesundheitsberatung e.V. UGB, Gießen. S. 27-29, 1997

Wetzel, W.-E.  
Kariesprophylaxe durch Ernährung.  
2. Ernährungsforum der Deutschen Gesellschaft für Ernährung e.V. – Sektion Hessen, S. 9-10, 1999.  
DGE, Niddatal, Augasse 1g

Wetzel, W.-E.  
Prothetische Therapieformen bei Kindern und Jugendlichen. In: Lehmann, K.M. (Ed.): Zahnersatz in der Diskussion.  
Kuratorium perfekter Zahnersatz. Kilian, Marburg 1999. ISBN 3-932091-40-X

Wetzel, W.-E.  
Oralhygiene bei Behinderten. In: Zahnmedizinische Prophylaxe bei Behinderten. 2. überarbeitete und erweiterte Ausgabe.  
Deutsche Arbeitsgemeinschaft für Jugendzahnpflege e.V. (Ed.), Bonn 1999. ISBN 3-926228-14-8

Wetzel, W.-E.  
Kompromisse und Grenzen in der Kinderzahnheilkunde. In: Ferger, P. (Ed. ): Kompromisse und Grenzen in der Zahnärztlichen Behandlung.  
Spitta, Balingen 1999

## 20.5 Invited presentations at international meetings

Wetzel, W.-E.  
Fluoridkonzentration in Kinderzahnpasten - Kooperation zwischen Zahnarzt und Kinderarzt.  
Symposium Kariesprävention durch Kinderzahnpasten: Wieviel Fluorid ist notwendig? Wieviel ist ausreichend?  
Gaba International AG. Basel / Switzerland, 26.-27. November 1998

## 20.6 Higher degrees awarded (Dr. med. dent.)

Böhmer, Christoph  
Mikrobiologische, rasterelektronenmikroskopische und mikroradiographische Untersuchungen zur Entstehung einer in-vitro-Karies durch *Candida albicans*.  
Supervisor: Prof. Dr. W.-E. Wetzel

Boemans, Barbara  
Häufigkeit und Einflüsse auf die Milchzahnkaries bei 6- bis 36-monatigen Kleinkindern. Vergleich der Befunde 1987 und 1996 in Mittelhessen.  
Supervisor: Prof. Dr. W.-E. Wetzel

Zaikpour, Hashem  
Freisetzung niedermolekularer Kohlenhydrate aus Maltodextrinen und maltodextrinhaltigen Kindertees unter Einfluss von  $\alpha$ -Amylase und Speichel.  
Supervisor: Prof. Dr. W.-E. Wetzel

Szegoleit, Franziska  
Einfluss umfassender Gebissanierung sowie Verabreichung von Nystatin und Amphotericin B auf die Candidabesiedelung der Mundhöhle.  
Supervisor: Prof. Dr. W.-E. Wetzel

Lorbeer, Jan  
Häufigkeit und Einflüsse der Milchzahnkaries bei Kindergartenkindern; Vergleich der Befunde 1986 und 1996.  
Supervisor: Prof. Dr. W.-E. Wetzel

## 20.7 Scientific Awards

Dr. K. Petersen

Recipient of the "Promotionspreis" at the Annual Session of the "German Society of Osteogenesis imperfecta" in Mauloff / Germany 1997.

Title of the thesis: "Klinische und röntgenologische Befunde im Zahn-, Mund- und Kieferbereich bei Patienten mit Osteogenesis imperfecta".

Prof. Dr. W.-E. Wetzel

Recipient of the "THOLUCK-Medaille" at the Annual Session of the "Arbeitskreis Zahnmedizinische Information", awarded on the occasion of the "Tag der Zahngesundheit" (Dental Health Day) 1997 on the suggestion of the "Bundeszahnärztekammer" (National Organisation for Dentists in Germany), the "Kassenzahnärztliche Bundesvereinigung" (National Organisation of social insurances) and the "Deutsche Arbeitsgemeinschaft für Jugendzahnpflege" (German Society for Children's Dental Care) for his public efforts to overcome the nursing-bottle syndrome.

### G. Oral Surgery, Maxillofacial Surgery

Representatives: Name: Prof. Dr. Dr. H.-P. Howaldt, Prof. Dr. H. Kirschner  
e-mail: Hans-Peter.Howaldt@chiru.med.uni-giessen.de

20.1: 20

20.2: 1

20.3: 5

20.4: 2

20.5: 4

20.6: 8

20.7: 4

## 20.1 Publications in Refereed Journals

Filippi, A.

Ozone in oral surgery - current status and prospects. Ozone Sci Eng 19, 387-393 (1997).

Filippi, A, Kirschner, H.

Replantation of avulsed primary anterior teeth - Method of treatment and limitations. J Dent Child 64, 272-275 (1997).

Filippi, A, Dreyer, T, Bohle, R-M, Pohl, Y, Rousseau, S.

Sequestration of the alveolar bone by invasive aspergillosis in acute myeloid leukemia. J Oral Pathol Med 26, 437-440 (1997).

Filippi, A.

Ozone is the most effective disinfectant for dental treatment units: results after 8 years of comparison. Ozone Sci Eng 19, 527-532 (1997).

Filippi, A, Dreyer, T, Bohle, R-M, Pohl, Y, Bürger, H, Rousseau, S.

Aspergillose der Lunge und des Alveolarknochens bei akuter myeloischer Leukämie. Dtsch Z Mund Kiefer Gesichtschir 20, 237-239 (1997).

Howaldt H-P, Klein C, Dederichs A:

Lateral orbitectomy for correction of endocrine ophthalmopathy. Mund Kiefer Gesichtschir 1, 169-173 (1997).

Pohl, Y, Kirschner, H.

Nachuntersuchungen zur intentionalen auto-alloplastischen Reimplantation pulpatoter wurzelunreifer Frontzähne. Dtsch Zahnärztl Z 52, 180-185 (1997).

- Blecher JC, Howaldt H-P:  
Behandlung nicht-synostotischer kindlicher Schädeldeformitäten mit dynamischen Kopforthesen.  
Mund Kiefer Gesichtschir 2 (Suppl), 81-85 (1998).
- Filippi, A, Pohl, Y, Tekin, U.  
Transplantation of displaced and dilacerated anterior teeth. Endod Dent Traumatol 14, 93-98 (1998).
- Jünger TH, Klingmüller V, Howaldt H-P:  
Standardisierte sonographische Verlaufskontrolle bei der Kallusdistraktion am Unterkiefer. Mund Kiefer Gesichtschir 2, 331-335 (1998).
- Kirschner, H, Boll, M, Filippi, A, Foerster, W, Kraus, U, Obijou, C, Pohl, Y, Robert, F, Tekin, U.  
Frontzahnverletzungen. Vorbeugen und Retten. Oralprophylaxe 20, 101-106 (1998).

Koch H, Grzonka M, Koch J:  
The pathology of the palatal aponeurosis in cleft palates. Cleft Palate Craniofac J 35, 530 (1998).

Steinberger D, Jünger TH, Howaldt H-P, Christophis P, Müller U:  
Mutation of FGFR2 (cys278phe) in craniolacunia and pansynostosis. J Med Genet 36, 499-500 (1999).

Filippi, A.  
Reimplantation avulsierter Milchzähne - eine kritische Bilanz nach 5 Jahren. Z Zahnärztl Implantol 15, 154-157 (1999).

Filippi, A.  
Autoalloplastische Transplantation verlagerter und dilazerierter Frontzähne. Z Zahnärztl Implantol 13, 218-222 (1999).

Filippi, A, Pohl, Y, Tekin, U.  
Sensory disorders after separation of the nasopalatine nerve during removal of palatal displaced canines: prospective investigation. Br J Oral Maxillofac Surg 37, 134-136 (1999).

Howaldt H-P, Kainz M, Euler B, Vorast HE, on the behalf of the DÖSAK:  
Proposal for modification of the TNM staging classification for cancer of the oral cavity.  
J Craniomax Fac Surg 27, 275-288 (1999).

Jünger TH, Klingmüller V, Howaldt H-P:  
Application of ultrasound in callus distraction of hypoplastic mandibles - an additional method for the follow-up. J Craniomax Fac Surg 27, 160-167 (1999).

Pohl, Y, Tekin, U, Boll, M, Filippi, A, Kirschner, H.  
Investigations on a cell culture medium for storage and transportation of avulsed teeth. Austr Endod J 25, 70-75 (1999).

Wagner, Y, Filippi, A, Kirschner, H, Dreyer, T.  
Zytokeratin- und p53-Expression odontogener Zysten. Mund Kiefer Gesichts Chir 3, 263-269 (1999).

## 20.2 Textbooks published by staff

Kirschner,H.  
Atlas der chirurgischen Zahnerhaltung. 2. ed. Hanser, München (1996).

## 20.3 Chapters in Books

Pohl, Y, Filippi, A.  
Chirurgische Zahnerhaltung. In: Koçkapan, C. (Ed. ) Endodontie. 2. ed. Lehmanns (1998).

Jünger TH, Steinberger D, Christophis P:  
FGFR-assoziiertes Craniostosesyndrom mit Craniolacunia. 4. Schädelbasiskongress, Hamburg  
1998, Einhorn Verlag

Schroth I, Christophis P, Kästner S, Jünger TH, Jödicke A, Howaldt H-P, Böker D-K: Management und operative Therapie bei frontobasalen Schädelfrakturen, 4. Schädelbasiskongress, Hamburg 1998, Einhorn Verlag

Howaldt HP:  
Data collection: the DÖSAK experience. In: Ward, Booth P, Schendel SA, Hausamen JE: Maxillofacial Surgery, Churchill-Livingstone, ISBN: 0443058539, Edinburgh, London, New York, 1999, 815-821

Howaldt H-P, Kainz, M., Euler, B., Vorast, H.E.:  
Prognostische Überlegungen zum Mundhöhlenkarzinom auf der Grundlage des DÖSAK-Registers. In E. Esser (Hrsg.): Disputation: Mundhöhlen-Oropharynxkarzinom - Prognose und Radikalität, ISBN: 30-00-002613-4, Eigenverlag, 1998

## 20.4 Grants received

Howaldt H-P:  
Project: DÖSAK-Tumorregister, Untersuchungen zur Prognose und Therapie von Mundhöhlenkarzinomen. Grant received from the Deutsche Krebshilfe (DM 2.000.000,-)

Howaldt H-P, Müller U, Kriete A, Jünger TH, Steinberger D:  
Project: "Ätiologische Klärung prämaturer Nahtsynostosen durch klinische Dokumentation und molekulargenetische Untersuchung" (Classification of craniosynostosis by means of standardized clinical evaluation and genetic investigation).  
Grant received from the Deutsche Forschungsgemeinschaft (Ho 1206/5-1) (DM 260.000.-)

## 20.5 Invited presentations at international meetings

Jünger TH, Howaldt H-P:  
Application of ultrasound in callus distraction of the mandible - an additional method for the follow up.  
Craniofacial Distraction: The first Decade, New York City, November 1998

Jünger TH, Howaldt H-P:  
Callus distraction of the anterior pelvic arch in a case of bladder exstrophy. Craniofacial Distraction:  
The first Decade, New York City, November 1998

Howaldt H-P, Jünger TH:  
Experiences with mandibular distraction. International Congress on Cranial and Facial Bone  
Distraction Processes, Paris, May 1999

Blecher JC, Howaldt H-P:  
Conservative treatment of nonsynostotic head deformations in infants, a four year experience. Annual  
Meeting of British Association of Plastic Surgeons, London, December 1999

## 20.6 Higher degrees awarded

### 20.6.1 Dissertationen (Dr. med. dent.)

Tischer, T.  
Mundgesundheit der Bevölkerung im Königreich Tonga: Pro- und retrospektive Studien in der Dental  
Section des Vaiola Hospitals auf Tonga.  
Supervisor: Prof. Dr. H. Kirschner

Domagalla, S.:  
Die Wurzelspitzenresektion mit retrograder Goldstopffüllung: Eine retrospektive Studie.  
Supervisor: Prof. Dr. H. Kirschner

Krey, Th.

Grundprinzipien, Einsatzmöglichkeiten und Rahmenbedingungen für den Einsatz computerbasierter Lehr- und Lernprogramme in der Medizinerausbildung  
Supervisor: Prof. Dr. H. Kirschner

Adam, H.J.

Zur Verlässlichkeit unterschiedlicher radiologischer Technika bei der Lagebestimmung von retinierten und verlagerten Zähnen im Oberkiefer.  
Supervisor: Dr. A. Filippi

Nolting, P.

Untersuchungen über den Einfluß von Faktoren im Serum Schwangerer mit Präeklampsie auf die Verformbarkeit von Erythrozyten Schwangerer mit komplikationsloser Schwangerschaft.  
Supervisor: Prof. Dr. H.-P. Howaldt

Weers, Th.

Thermometrische Untersuchungen zur enossalen Temperaturentwicklung in Abhängigkeit von der Kühlmethode  
Supervisor: Dr. Y. Pohl

Weiß, V.

Maligne Tumore in den Mund-, Halsbereichen. Eine retrospektive Studie.  
Supervisor: Prof. Dr. H. Kirschner

## 20.6.2 Habilitationen (Ph.D.)

Filippi, Andreas

Klinisch-experimentelle Untersuchungen zur Wundheilung von Oralgeweben unter Einfluß von Ozonwasser, 1999.

## 20.7 Scientific awards

In 1998 Prof. Dr. H. Kirschner was elected foreign member of the Academie Nationale Francaise de Chirurgie Dentaire.

Award for best presentation

Pohl, Y, Filippi, A, Kirschner, H.

Desmodontale Heilung und kieferorthopädische Therapie nach intentionaler autoalloplastischer Reimplantation pulpatoter Frontzähne. Arbeitsgemeinschaft für Zahntrauma in der ÖGZMK, 1. Österreichische Fachtagung für Zahntrauma, Graz (1997).

Award for best presentation

Filippi, A, Tschan, J, Berthold, H.

Retrospektive Klassifizierung von Zahnverletzungen mit einem neuen Prognosescore.  
Arbeitsgemeinschaft für Zahntrauma in der ÖGZMK, 2. Österreichische Fachtagung für Zahntrauma, Salzburg (1999).

Award for the best poster presented

Jünger TH, Reicherts M, Christophis P, Steinberger D, Collmann H:

"Klassifikation von Kraniosynostosen durch klinische Dokumentation und Zuordnung zu Genmutationen". 49. Kongress der Deutschen Gesellschaft für Mund-, Kiefer-, Gesichtschirurgie, Basel (1999)

## Visitors' Comments

The School should be congratulated on the quality and quantity of its research programme. A research strategy and thematic approach would improve the already high standard.

## **Section 21: Quality Development**

### **1. Introduction**

Quality development is an integrated part of the continuous improvement program.

### **2. Aims & Objectives**

A quality management system aims at the continuous improvement of the student training and the treatment itself. It can also help to identify areas requiring further improvement. Such areas include the following:

- defining and analysing the existing situation
- establishing the objectives of improvement
- searching for possible solutions
- evaluating this solutions
- implementing the selected solution
- verifying the obtained results

### **3. Current Projects**

Within the Faculty of Medicine as a whole there is a broad range of programs for quality assurance in education, e.g. teachers' training by university courses; organisational development program for continuous improvement of study and learning environment; formative student evaluation of courses lead by departments or centrally by AGMA (Dean's working group for Medical Education). Evaluation of teaching will be made mandatory by law (Hochschulgesetz) within the next few months, accompanied by reinforcement of leading faculty staff to assure quality of study.

As no special quality assessments are available yet in the field of Preventive Dentistry, the issues taught in our student courses are based on early diagnosis, health check-ups FU 1 to FU 3 for infants between 2,5 and 6 years introduced by the statutory health insurance companies in 1999, as well as on individual prophylactic measures in patients from age 6 to 18. The standards given (indices for the detection of caries risks, oral hygiene, saliva characteristics and the grade of inflammation of gingiva) make possible a good didactical feedback concerning preventive measures carried out by students with young patients during longer periods.

As a pilot project the Department of Prosthodontics is on the way to establish a quality management system based on the principles of ISO 9000 ff that emphasises the educational process. This includes the development of structured working plans for the students as well as a comprehensive, systematic and regular review of the system itself.

### **4. Strengths**

Essential aspects of quality management are continuously integrated in the curriculum.

### **5. Weaknesses**

Due to the lack of qualified computer specialists and the overall shortage of staff, quality development may take an unfavourable long time.

### **6. Visitors' Comments**

- The Quality Management System that is being developed in Prosthodontics shows great promises and resources should be made available to extend the work in Giessen and other Dental Schools.
- At present there is no formal attempt to monitor the quality of teaching. Course documentation with clear statement of objectives should be generally available.

## Section 22: Visitors Executive Summary

The visitors have no doubt that the Dental School in Giessen provides a good dental education and high quality research and patient care. The University and the Faculty must be congratulated on the provision at an excellent facility, which not only benefits the local population but must also be envied by colleagues in Germany and Europe generally. In many European countries, the integration of Medical and Dental Education that is evident in Giessen would be difficult to duplicate and the Dental School collectively should be congratulated for this. The visitors were most grateful for the opportunity to review the Teaching, Research & Service that is provided in the context of the DENTED program. During this process the visitors have learned a great deal and they hope that the School has learned a little. Whatever else, everyone will benefit intellectually from the exercise.

### Main findings

- The Dental School works well, has excellent facilities, a highly qualified and dedicated staff and enthusiastic students
- Giessen has more academic departments than most schools in Germany, which is commendable. It will allow special competencies to grow in a helpful environment, which must benefit the development of dental education.
- The content of the curriculum is currently controlled by Federal Legislation and a large amount of time is invested in basic medical science and technical procedures. The rather rigid boundaries between the preclinical and clinical blocks complicate the integration of the preclinical basic sciences and the clinical disciplines. National plans to rationalize this are supported and changes should be introduced as soon as possible.
- The Final State Board Examination as well as Naturwissenschaftliche Vorprüfung and Zahnärzliche Vorprüfung are subject to the same legislation. Discussions are also on going to review this but before any changes are finalized, the current balance between oral and written examination should be reviewed.

### Strengths

- The availability of IT hardware is more than adequate. The early introduction of student to the management of clinical data is an example of best practice.
- The School clearly recognizes the importance of Evidence Based Care and demonstrated willingness to translate it into the curriculum.
- Many basic sciences, medical, preclinical and clinical departments would welcome attempts to rationalise the curriculum and time table and are eager to join any review process.
- The Periodontology and Conservative Departments cooperate closely and there are plans to introduce integrated patients care by students. This is most welcome and should be encouraged.
- The active selection of topics for the clinical pharmacology and clinical chemistry course were exemplary and appropriate for dentistry.
- The creation of a joint department of oral surgery and oral and maxillofacial surgery

### Weaknesses

- Teachers in all the disciplines in the Faculty considered that there was a lack of co-ordination between teaching of individual subjects and between basic science and medical subjects and clinical dentistry.
- At present students are not introduced to patient care until the beginning of the clinical course in the fourth year. This should be addressed as soon as legislation permits. In the mean time voluntary attendance in clinics by preclinical students should be encouraged.
- There is very little teaching of Psychology, Behavioral Science, Ethics and Jurisprudence and Communication Skills. This deficiency should be addressed as part of Public Dental Health as soon as possible.
- CPR training is currently organized by the students themselves. This should be an integral part of the curriculum and should be delivered by the Department of Anesthesiology
- Formal staff development is not undertaken
- Student-staff communication could be improved. This should be linked to a budget heading
- The teaching of oro-facial pain is not well defined and should include the appropriate medical specialties e.g. Neurology and Psychiatry

## **Innovations and best practices**

- Assessment methods for case analysis and case presentation in the orthodontic department
- The patient recall and the computer-based medical record in Prosthodontics offer a good basis for student enhancement and assessment.
- The ambulance system in Prosthodontics offers good opportunities to students to regularly present cases in small groups. Teachers evaluate these.
- Leadership in the development of Dental Public Health
- Students are given a broad basic scientific knowledge of Periodontology and practical instruction in small groups; special intensive training courses are included
- Students are issued with questionnaires in periodontology to assess the quality of the teaching. All of these are returned and analyzed and the information is used to improve performance. This is an example of good practice
- The development of gerodontology in the department of Prosthodontics
- A transparent budget in the Faculty
- The group prophylaxis project in a Kindergarten

## **Recommendations**

- A curriculum committee (or equivalent) should be developed to review the present arrangements and make recommendations for the future. The Committee should include the Heads of all the dental, basic and paraclinical science Departments.
- Dedicated sessions should be introduced to teach holistic dental care. Staff from all departments should be included in this process.
- Prevention should be a priority early in the curriculum.
- The visitors were told that the clinical workforce is not enough to deliver the agenda that the staff and students consider necessary. It is important that the situation is reviewed in the immediate future and subject to the outcome of this process appropriate solution should be determined.
- Although external examiners are not used in Germany, the concept is worthy of further local consideration.
- Although a national dental survey has recently been carried out in Germany, a local oral health assessment would assist curriculum development.
- A student staff forum should be established.