



## **DENTED SITE VISITATION**

**Centre for Oral Health Sciences  
Malmö University  
Malmö  
Sweden**

**18<sup>th</sup> – 22<sup>nd</sup> September 1999**



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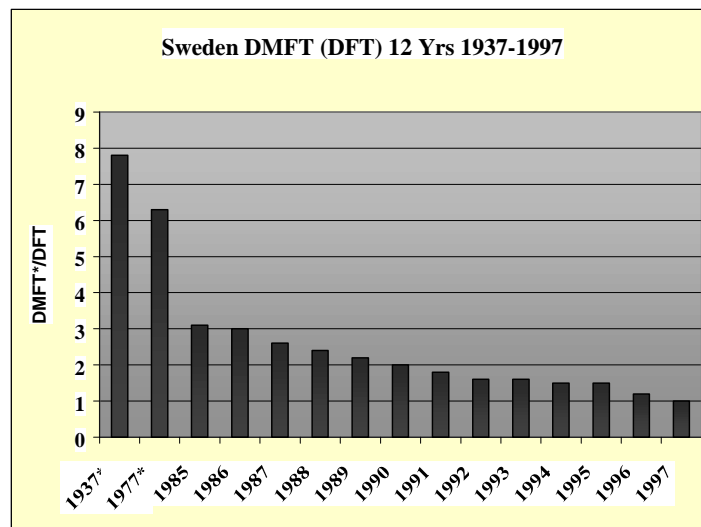
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### 1.1. Background

The 'School of Dentistry' in Malmö was inaugurated in 1948. The new school was urgently needed, considering the prevalence of dental diseases at that time. Just a few years before, Westin and Wold in 1943 had presented a survey on military recruits. This study had shown that only one recruit out of 1000 was caries free. Data from 12-years-olds in 1937 showed a mean DMFT close to 8, and was still high in 1977. During the past two decades however, a significant decline in dental caries took place, as illustrated in Fig 1. In 1997, the mean DMFT was reduced to 1.0, one of the lowest values for any industrialised country in the World, and about 50 % of 12-years old are now caries-free.



Certainly, this dramatic change in oral health must affect, and has affected, the dental curricula in Sweden. The reasons for the decline must be understood and measures to keep the improved health undertaken. At the same time, due to effective developments in restorative dentistry and periodontology, the ageing people are keeping their teeth much longer compared to the past, many of them often presenting difficult treatment problems. Also, an increased risk for root surface caries is noticed among elderly. A further concern is presented from large immigrant groups from countries where there has been a lack of both preventive and conservative services.

This scattered epidemiological picture forms the background for the development of our curriculum. It also stresses the need for an educational system giving the students a capacity to adapt to new situations and to continuously seek for new information.



At the same time, due to effective developments in restorative dentistry and periodontology, elderly people are keeping their teeth. In 1997, only 2% of the population are full denture wearers and 6% of 20 to 65-year-olds have a partial denture. Many older patients present with difficult treatment problems including complex technological constructions and an increased risk for root surface caries. A further concern is presented by the large immigrant groups from countries where there has been a lack of both preventive and conservative services. The issues mentioned above raise fundamental questions about the traditional concepts of professional ethics. The relations between the public and the profession are changing; patients will be better informed and demand a greater say in their oral health care. A basic goal of education will therefore be to enable the students to develop a greater awareness of the patients' viewpoints and of the importance of behavioural and social factors.

The educational background for the development of a curriculum should be seen from the reality that the world is changing. During the 20<sup>th</sup> century, thinking and acting in developed countries has been dominated by the paradigm of the Industrial Society. However, Society now is changing and there is evidence that changes are no longer only quantitative but also qualitative. When we learn, we change, on an individual level, on an organisational level and on the level of the Society. In a Learning Society the stance towards resources, human beings, education and leadership is different from that of the Industrial Society. As the individual is the owner of the knowledge, there is a focus on human beings and their development of knowledge and learning both as individuals and as members of teams and of organisations. Therefore, it is important to create forms of learning that prepare students for a Learning Society where they have to handle many different situations in the future. These situations are often unlike the situations in which students are being prepared. The ability of the students, our future colleagues, to take effective and appropriate actions within changing circumstances is developed through an integration of discipline knowledge, learning and clinical experiences. Basically, we are preparing our students for the uncertain future.

The Dental School as an institution was founded as an independent unit. Between 1964 and 1999 the Odontological Faculty was one of nine faculties of Lund University. The 1<sup>st</sup> of January 1999 we became one sector out of five of the newly established Malmö University, which currently has 8000 students. The undergraduate dental education in Malmö was closed 1985 and reopened in 1990 by the Swedish government. When we developed the new curriculum, we decided to take the changed oral health pattern and contemporary educational concepts into account. The goal is to design learning environments where the students can develop their clinical competence in primary oral health care and prevention with an emphasis on whole-patient care. The change of the official name of the School of Dentistry to the Centre for Oral Health Sciences reflects this approach. The main educational approaches of the curriculum are problem-based learning in small study-groups and clinical learning experiences, which takes up the greatest amount of time in the students' career.

The city of Malmö (about 250.000 inhabitants, among them 33% are immigrants) is the third biggest city in Sweden and located in the southwest of Sweden in close proximity to Denmark and North Germany. The bridge between Malmö and Copenhagen, which is to be opened in the year 2000, will facilitate communication within the most densely populated area in Northern Europe.

## 1.2 Primary Functions of the Centre for Oral Health Sciences

The primary functions of the Centre for Oral Health Sciences are to provide

- Clinical training and education of undergraduate dental students designed to meet the goals of the Swedish Higher Education Ordinance and standards laid down by the EU Dental Directives
- Clinical training and education of undergraduate dental technician and dental hygienist students. Co-operation in education of undergraduate dental nurses
- Research training and education for the degrees Odontologie Doctor (Odont. Dr.) and Odontologie Licentiate (Odont.Lic.)
- Research
- Community service (The Third Mission) - to inform Society about professional advances and to contribute and improve on the knowledge development in Society
- Patient Services. About 10 000 patients visits the students' clinics yearly. In addition, the faculty staff works as specialists in "teachers clinics"
- Clinical training and education of specialists in their chosen speciality designed to meet the requirements of the Swedish Board for Health and Welfare. The training is carried out in co-operation with Region Skåne and the Public Dental Health Service
- Continuing training and education of the oral health team (dentists, dental hygienists, dental nurses, dental technicians).

## 1.3 Visitors Comments to Introduction and General Description

### Visitors Comments

The oral health condition of the Swedish population is regarded as amongst the best in western European countries. The prevalence of caries, periodontal disease and edentulousness is relatively low. On the other hand there are groups of persons who run a risk of developing severe caries or periodontal disease. Many older people show a dentition in need of repair with an urgent wish to maintain a natural dentition. The demand for oral health care is therefore high, and a reduction in output of dentists has contributed to a shortage of dentists currently.

The programme for the training of dentists in the Malmö dental school is based on the following principles:

- oral health
- teamwork
- self-directed learning
- holistic view

These principles are more and more accepted in dental education all over the world as an answer to the question as to how to train dentists for the future. The Malmö dental school, however, has taken a worldwide lead in establishing these concepts.

The Malmö dental school is situated in a favourable working environment. A large number of immigrants with relatively poor oral health reside in the vicinity of the school and provide a flow of patients. Close co-operation with the Public Dental Service provides opportunities for patient care within the School and collaborative learning for dentists. The Dental School in Malmö is an important part of the newly

established University of Malmö. The educational philosophy of the School also serves as an example for other faculties.

## Section 2: Physical Facilities

(including Library, Lecture Theatres, Seminar Rooms etc)

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### 2.1 Planned Developments

The building of the school was completed in 1949 for 500 students. Shortly after the reopening of the undergraduate dental education 1990, an intensive rebuilding of the clinical wing began. In 1994 the renovation of the 3<sup>rd</sup> floor (prosthodontics, stomatognathic physiology and the comprehensive oral health care clinic for adults) was finished. In 1995 the 4<sup>th</sup> floor (cariology and endodontics) and the 5<sup>th</sup> floor (periodontology, dental hygienist education and research laboratories) were rebuilt. The 2<sup>nd</sup> floor (pediatric dentistry, orthodontics and comprehensive oral health care clinic for children and adolescents) was reopened in 1998. The plan is to rebuild the 1<sup>st</sup> floor (oral biology and oral microbiology, oral pathology, oral surgery and oral medicine) and the ground floor (oral diagnosis, oral radiology and service units) in the near future. After that renovation of the rest of the building will continue.

As the number of students has decreased from 500 to about 250 some space in the building has become superfluous. A commercial dental laboratory hires the ground floor of the laboratory wing and the 2<sup>nd</sup> floor of the laboratory wing will in the future be available for hire. Plans are completed for rebuilding the laboratory wing and other areas.

### 2.2 Clinical Facilities

There are student clinics for care of adult patients on the 5<sup>th</sup>, 4<sup>th</sup> and 3<sup>rd</sup> floors and for children and adolescents in the 2<sup>nd</sup> floor. The clinic for adult comprehensive care, including treatment of patients seeking for emergency care, is situated on the 3<sup>rd</sup> floor. In total there are 88 dental chairs in the clinics for adult patients and 15 dental chairs for children and adolescents. Furthermore, all dentists being teachers are obliged to take care of patients in specialist clinics the so-called teacher-clinics, in all 18 chairs. These clinics are based on the different clinical specialities under the supervision of the Committee for Oral Health Care. Additionally there are specialist clinics for Oral Surgery and Oral Medicine and Oral Radiology.

All patients are examined and administered by the dept. of Oral Diagnosis on the ground floor. The faculty has constructed a computer-based administrative program for patient data. All clinical floors are equipped with computers.

The collaboration with the medical faculty is strong and preclinical as well as clinical medical training is performed at Malmö University Hospital, situated close to the dental school. Oral Surgery is integrated with the Maxillofacial Centre of the University Hospital and Oral

Radiology has access to modern radiographic equipment at the department of Medical Radiology.

### **2.3 Teaching Facilities**

The building has 3 lecture rooms (50 seater) and one lecture hall (250 seater). Each department in the renovated area has a seminar room (presently 8 rooms). There are 14 group rooms for the student PBL study-groups. There is a computer room for the students equipped with 10 personal computers connected to Internet and with Microsoft office package. Additionally, the faculty has access to all teaching, recreational and cultural facilities of Malmö University.

### **2.4 Teaching Laboratories**

The building has a skills laboratory in the laboratory wing with 40 units providing shared facilities for all preclinical dental training. The laboratory is equipped with manikin heads as well as 8 dental chairs. There is also a clinical dental laboratory in connection with the clinic of prostodontics. The laboratories for dental technician students are situated close to the skills laboratory for dental students. Some research facilities in oral technology are common. Furthermore, there are specialist and research laboratories in depts. of Oral Pathology and Oral Microbiology.

### **2.5 Research Facilities**

Research laboratories are located on the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> floors, each equipped for different research functions. An animal laboratory is located on the 6<sup>th</sup> floor.

### **2.6 The Library and its Resources**

#### *General Introduction*

The main users of the Faculty Library are the 250 undergraduate students, 45 postgraduate students and 250 employees. Dentists throughout the region also make use of its services.

The Library is open 43 hours per week as follows:

Monday, Tuesday, Thursday: 9.00am - 6.00pm

Wednesday, Friday: 9.00am - 5.00pm

During semester time the Library has about 200 visitors per day – approximately 95 % of these are employees or students of the dental school. The researchers, lecturers and research students can sign for a key to the Library and gain access to the Library at all times.

#### *The Library's Role in Undergraduate Education*

Since 1990, problem-based learning (PBL) has been applied as the educational method. The Library plays an important part in the process of knowledge acquisition. Students are given courses in library skills during the Introduction Course. The Library Staff continue to educate them in the use of databases when necessary. Simple user manuals for the most important databases can be found next to the computers.

When completing their course evaluations in June 1997, dental students were asked to participate in a survey designed by the Library Committee. On the whole the Library received very good evaluations; the staff in particular was highly praised. The most common complaint was too few circulation copies of resource literature.

#### *Staff and Budget*

The Library Staff consists of two librarians who both work part-time, one 80% of full-time (32 hours per week) and one 70% (28 hours).

The Library's working budget this year is 475,000 SEK.

The largest items of expenditure in 1998 were as follows:

Journals	173,000 SEK		
Book Acquisition	167	"	"
Medline	29	"	"
Computers	27	"	"

#### *Premises and Equipment*

At present the Library has an area of 150 m<sup>2</sup>. There is one reading-room with 13 study places. A new Library is planned and the plans could be realised within two to three years.

The Library has been computerised (both the catalogue and circulation system) and the books are provided with an anti-theft device. The Library has an automated loaning module so that Library users can loan books by themselves. There are seven PCs and two printers at the users' disposal. There is also a photocopier for which copy cards are available at 0,50 kr per copy.

#### *The Collection and its Use*

The Library is a specialist Library for Odontology, whose holdings consist of around 15,000 monographs and 160 periodicals. In 1999, the Library began to subscribe to nine electronic periodicals via Internet.

Via the Library home page on the WWW one can find important databases and other useful links within the field of Odontology. A larger choice of electronic aids is available on Malmö University College's home page. Internet searching is possible on several of the Library's computers.

In 1998 there were 6942 completed loans registered in Lolita (the computerised Library catalogue). Added to this are the study-group room loans (about 700 loans/year) and periodical loans, which are not yet computerised. Altogether all loans - manual and automated - came to approximately 8500. The Library also has an extensive inter-library loan system. In 1998 the Library received 863 requests for article copies and 103 book loan requests to other libraries, and requested and received 254 article copies and 45 book loans from other libraries.

## **2.7 Student Facilities**

#### *Students union facilities*

The student union is housed on the ground floor of the laboratory wing. The premises consist of one pause room (30 seater) and a small office. The student union has a rental agreement with the faculty for these spaces. It was rebuilt in 1998. The pause room is equipped with two

microwave oven and a dishwasher. The pause room is often used for student parties and other entertainment. It is also possible for the faculty employees to rent it.

#### *Other student facilities*

Students have access to the computer room, 14 study-group rooms (all described under teaching facilities) and changing-rooms all week including weekends from 07.00 am to 11.00 pm. Students changing-rooms and lockers are located in the basement in the teaching/laboratory wing.

## **2.8 Comments to Physical Facilities**

### **2.8.1 Strengths**

- The newly built clinical floors are modern and equipped with new dental units of very high quality.
- Comprehensive library services.
- Several study-group rooms and seminar rooms in harmony with the educational approach
- High standard of hygiene, cross-infection control and environmental control. The Committee for Environmental issues has produced hand-books for hygiene and environmental issues.
- Several laboratories of good standard

### **2.8.2 Weaknesses**

- A large part of the faculty is not rebuilt and there is a need of renovation.

### **2.8.3 Innovations**

- The new clinics have a very high standard with regard to both building and technical facilities.
- The entrances to the new clinics provide a welcoming atmosphere and the design by young Swedish artists who have been responsible for the decoration and art.
- The clinics for comprehensive care, adult and for children, provide efficient multipurpose use with integration of all departments.
- The specialist clinics are of high standard and there are agreements between the Public Dental Health Service of county Skåne and the faculty to treat referred patients at the faculty.
- Malmö university has a plan for environmental development. The school is following this plan, but in addition the Committee for Environmental issues has developed a plan for the school.

### **2.8.4 Plans for future changes**

- There is a plan for further rebuilding of the school.

## **2.9 Visitors Comments on Physical Facilities**

The physical facilities of the Dental School can be characterized as spacious and centrally located. A process of renovation of the School is taking place, so there are some old facilities and some very new. The decision to stay in the city-centre and renovate the building is to be appreciated as it ensures good accessibility for patients. The presence of a school next door to the building enhances the opportunities for children's oral health care.

Planning of the further renovation of the school is continuing. It is essential that this renovation continues to take place. To maintain an influx of sufficient numbers of patients and to ensure a proper environment for teaching treatment planning, the facilities for oral diagnosis and radiology should be updated as soon as practicable.

### **Clinical facilities**

As soon as renovation is completed the clinical facilities will meet the highest requirements. Older parts of the School are very well maintained, though not meeting the requirements of modern dental equipment, for instance concerning ergonomics. The number of dental chairs is sufficient to meet the demands for clinical training and patient care by staff-members.

Further expansion in the layout of the School in clinical units should be carried out with caution to avoid too strong an emphasis on the individual clinical disciplines at the cost of comprehensive patient care.

The facilities for hygiene and infection control are of a very high standard. As the procedures are carried out by dental nurses, it is necessary to ensure that students, during their training, be sufficiently exposed to the procedures for hygiene and sterilization.

### **Teaching facilities**

The dental school has a number of lecture-rooms available. The large lecture room is of a traditional lay-out. Two smaller, very flexible lecture rooms serve the frequent seminars, that are part of the regular teaching and learning process. A sufficient number of study-rooms are available to accommodate many study groups. The availability of these study rooms at night is advantageous for the flexible way students are working.

### **Teaching laboratories**

The skills laboratory is well maintained and serves its purpose well. The number of places is sufficient. Any future renovations should be designed to provide better simulation of patient treatment. Together with computer assisted learning this would open up opportunities to establish teacher-independent training, etc. The already existing connection between preclinical and clinical training could be enhanced in such a way.

### **Research laboratories**

Ample space and equipment appears to be available. However, efficiency will be improved when some of the laboratory-facilities are centrally co-ordinated.

### **Library**

The library is very well equipped. Also the students have easy access to other facilities, e.g. the library of the medical school. Together with IT, the library functions as an excellent resource of knowledge and information, which is crucial in a PBL-based curriculum.

### **Student Facilities**

Study and social facilities in the School for students are excellent and in addition a new University student facility is now available.



### Section 3: Organisational and Administrative Structures

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#### **TOTAL BUDGET**

**SEK 105.000.000**

#### **SOURCES**

- *Gov.sources for education 17%*
- *Gov.sources for research 28%*
- *Gov.sources for oral health care 35%*
- *Other sources 20%*

#### **3.1 Organisational Structure**

*To be completed/inserted by Dental School*

### **3.2 Administrative Organisation**

*To be completed/inserted by Dental School*

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**For education and research:** Last semester, the Faculty Board adopted an IT- plan as part of its quality development and the plan was followed by instructions on how and when it should be implemented. The IT-plan with instructions was referred to the faculty committees for planning and implementation of activities at different organisational levels. It implies for example that all staff members and students should have basic knowledge and skills on the use of computers for writing and how to search information by the aid of Internet and Intranet. The specific needs of PBL (problem based learning) is given high priorities and students are continuously encouraged to retrieve and search for information in data bases for their knowledge development in the programme.

The information technology has the potential for international linking to other universities but as yet has not been put to any particular use. A special fund from the Swedish Council of Higher Education has been granted to Professor Rolf Attström for developing programs for distant learning in periodontology. Furthermore, the faculty has as a collaborating WHO centre responsible for a WHO database through Professor Douglas Bratthall, covering the global epidemiology of dental caries. An other part of the IT facilities of the faculty is the UCIV - University Centre for Interactive Visualisation – created in 1989 with a dedicated focus to create an image bank for dentistry. The unit, which is directed by Dr Bengt Sundström, presently serves as an open clearing house for networked information; entertaining, in particular, some Web-aware databases; harbouring eg the undergraduate course literature and the results of Elective assignments.

Students are given courses by other “expert” students from the faculty in general IT knowledge, Microsoft Word and Powerpoint, Internet and e-mail. Courses are also offered in many areas for students and personnel by the IT-department at Malmö university. Basic courses are presented in e.g. word processing, use of Internet and e-mail, as well as more advanced courses in the production of interactive computer programs.

Intranet is used by some departments and it will be introduced for the faculty this semester and increasingly be the standard way to present weekly information from the administration, faculty board and committees and educational groups of the faculty. The information to the students will include all information on the curriculum and course syllabus. Some information relevant to dental studies is already available on the www site of the faculty. E-mail addresses are available to all students but are used sparingly today.

**For oral health care and administration:** The faculty has developed an IT-system for patient management. This is a custom made system where visits and treatments are recorded for administrative purposes while the patient records are still kept on paper. The system is specific for national purposes as it is used to calculate the cost for dental treatment based on the Swedish insurance system. The faculty has planned to invest in a complete patient data base system including patient records, but the costs have been considered to be too high in relation to the quality of the existing programs. However, we will certainly have to buy such

a program in the near future, as it is common today that Swedish dentists use such systems. On a departmental level patient data systems are made for quality control of dental care.

**Availability of computers for students:** The library at the faculty provides access to computer databases and Internet (see description above). The computer room with 10 networked computers is presently upgraded with new computers and computers will be available on all clinical floors from this semester onwards. Furthermore, the students have access to the library of Malmö university and its computer facilities.

### **IT Systems**

Documentation regarding student progress: National student records database (LADOK)

Management and finance:	The system used by Malmö university is PROSIT
Administration and staff:	The standard is Microsoft Office package

## **3.4 Comments on Organisational Structures**

### **3.4.1 Strengths**

A rather uncomplex organisation governing all parts of the faculty. One organisation handling scientific research, education as well as dental care.

The level of education in IT of the academic staff and students is high

Advanced programs in periodontology for post-graduate education and in cariology for education of oral health professionals and WHO-statistics

A well-structured plan for IT-development

Grants received from the Council for Higher Education to develop program for computer aided learning

Students actually use IT for their self-directed learning

### **3.4.2 Weaknesses**

Recently part of a newly established and fast growing university. Some cultural clashes and lack of central administrative support.

Late introduction of Intranet and system for patient administration

Too few personnel for IT-service and development

IT-knowledge in non-academic staff is at a very varying level

Very few programs for the students computer-aided learning

### **3.4.3 Innovation**

The faculty is well functioning with a “matrix-organization”

### **3.4.4 Plan for future changes**

Education of all personnel in IT

Development of the system for patient management

Introduction of new programs for self-directed learning

### **3.5 Visitors Comments on Organisational and Administrative structures**

The organisational structure is clear, simple without many hierarchical positions. The Dean with the chairpersons of the committees set out the policies and approval is sought from the Faculty Board. The Board includes external members. It is also clear that this organisational culture is based on good personal relationships and communication. This is an important success factor for the achievements of the School.

The role of the 15 departments has to be seen more as clinical units rather than traditional large departments. However, they are considered important to maintain knowledge and skills in each area. The site-visit committee has some concern that the large number of departments might create an imbalance in the future, particularly in the light of curriculum in the school and the emphasis on the holistic approach to care

As far as funding is concerned it seems that the availability of research funds from the government plays an important role in attracting and keeping staff. It is important this is maintained in order to keep the number of full time faculty.

The IT system is being developed rapidly and the School in Malmö has taken a strong lead in distance learning through Professor Attström. Students are trained in the basic skills of IT and communications. Facilities are being developed and expanded and Intranet is part of this. A computerised patient management system is being considered.

## Section 4: Staffing

Persons in School who will explain and show this to the visitors:

Name: Mr Göran Lindahl, Chief Administrator e-mail: Goran.Lindahl@od.mah.se  
 Professor Lars Matsson, Dean e-mail: Lars.Matsson@od.mah.se  
 fax: 46 40 925359

### 4.1 Staffing Levels

Although the level of staffing will be available to the visitors from the information from the web site please complete the section on the next page for the purposes of visitation:

- The hosts' view on the strengths, weaknesses and innovations in gaining maximum benefit from staff available.

Clinical Academic Staff Statistics: (numbers in whole time equivalent)

Professors	14	
Other Senior Non-Professorial Staff	13	
Non Senior Full-time Staff	19	
Part-time Whole-Time Equivalent Staff	-	
Other Non-Clinical Academic Staff:		
Senior	4	
Non-Senior	24	
Administrative/Secretarial Staff	20	
Nursing Staff	48	
Dental Technicians	3	
Remaining Staff	39	
Student / Staff ratio	Professors included	8:1
	Professors excluded	6:1

## 4.2 Profile of Academic Staff Qualification

The departmental affiliation of the staff is presented in Enclosure 1. The staff qualification is as follows:

### Professors:

ATTSTRÖM, Rolf  
 BRATTHALL, Douglas  
 DÉRAND, Tore  
 GLANTZ, Per-Olof  
 KUROL, Juri  
 LARSSON, Åke  
 MATSSON, Lars  
 NILNER, Maria  
 NILNER, Krister  
 PETERSSON, Arne  
 ROHLIN, Madeleine  
 ROSENQUIST, Jan  
 SÖDERFELDT, Björn

### Senior Non-Professorial and Non Senior Staff with Odont.Dr or Med. Dr. degree:

ANDERSSON, Gunilla  
 ANDERSSON, Tomas  
 ARNEBRANDT, Tomas  
 AXTELIUS, Björn  
 BADERSTEN, Anita  
 BONDEMARK, Lars  
 BRATTHALL, Gunilla  
 CARLSSON, Peter  
 CHRISTERSSON, Cecilia  
 DAVIES, Julia  
 EHRNFORD, Lars  
 EKBERG, EvaCarin  
 ERICSON, DAN  
 HEINTZE, Ulf  
 HENRIKSSON, Thor  
 KINNBY, Bertil  
 KNUTSSON, Kerstin  
 LINDH, Christina  
 NILSSON, Bengt-Olof  
 NÄSSTRÖM, Karin  
 PETERSSON, Kerstin  
 RANDOW, Kjell  
 SVENSÄTER, Gunnel  
 SJÖGREEN, Bodil  
 SUNDIN, Birgitta  
 SUNDSTRÖM, Bengt  
 VALLON, Danila

WARFVINGE, Gunnar  
 WIDERSTRÖM, Lena  
 WRETLIND, Katarina  
 ÅKERMAN, Sigvard

Senior Full-time Staff:

GAMNER, Birgitta  
 LIEDBERG, Birgitta  
 LIEDHOLM, Rolf  
 LINDH, Liselott  
 LINDBERG, Pia  
 OBRANDT, Birgitta  
 RIDELL, Karin  
 ÅKERBLOM, Anna

### **4.3 Comments on Staffing**

#### **4.3.1 Strengths**

In our opinion the student/staff ratio is sufficient.

The age profile of the category Senior Non-Professorial Staff is satisfactory. In addition there is an even distribution of men/women in this group.

The majority of the Senior Non-Professorial Staff has a high level of scientific education (Odont. Dr. or Med. Dr.).

All appointments contain time for research as well as time for teaching and patient care. Highly motivated teaching staff regarding the students learning, the patients well-being and scientific research. The student/staff ratio.

#### **4.3.2 Weaknesses**

The age profile among the professors is in imbalance. In a short period of time several professors will retire and have to be replaced.

The total number of teachers has decreased during the last 15 years, which means that we now are close to the critical mass for innovation and research.

Expanding external market and low wages in academic institutions somewhat hinders recruitment of young teachers/researchers. PBL-system demands development of a new model in personnel-planning to secure coherent time-periods in scientific research.

#### **4.3.3 Innovations in gaining maximum benefit from staff available**

All senior teachers should be encouraged to take a scientific degree (Odont. Dr. or Odont. Lic). Special money has been directed to make it possible for the senior staff to spend time for full time research during up to half a year.

### **4.4 Visitors Comments on Staffing**

The academic/clinical staffing levels are adequate for the needs of the school. The staff/student ratio of 8:1 is good. The level of education of staff is excellent and this includes



academic, clinical and support staff. A staff development programme is in operation and is comprehensive and should be continued.

A number of senior staff (Professors) are due to retire soon and it is important they are replaced as soon as possible. The opportunity for staff to have exposure to schools in other countries should be expanded. Opportunities for research should also be extended and the introduction of more Post Doctoral students implemented.

## Sections 5-16: The Dental Curriculum

### INTRODUCTION

The departmental approach of the DENTED visitation document does not easily lend itself to a description of our curriculum. In order to reflect the philosophy behind the Malmö /curriculum, where different subject areas are integrated in a problem-based curriculum, we have chosen to describe the curriculum somewhat differently. In the enclosed paper (Enclosure 2: Rohlin M, Petersson K, Svensäter G. The Malmö-Model: a problem-based learning curriculum in undergraduate dental education. Eur J Dent Educ 1998;2:103-114), the Malmö-model is described on a curricular level, on a course level and on a weekly basis. In this self-assessment document we supplement the description in the enclosed paper by firstly describing the main characteristics of the curriculum. Secondly, the curriculum is described at the course level in the form of a course plan. Two other course plans are presented as Enclosures 3 and 4. Thirdly, the main integrated areas of the curriculum are described according to the DENTED-protocol. We have as suggested in the DENTED-protocol decided to present combined subject areas as integrated areas. Below the main integrated areas, some selected subject areas are described concerning the timing in the curriculum, the primary aims and main objectives. The sub-sections are as follows:

#### I. MAIN CHARACTERISTICS OF THE CURRICULUM

#### II. DESCRIPTION OF THE CURRICULUM AT THE COURSE LEVEL

(one course is equal to a semester of 20 weeks)

#### III. DESCRIPTION OF MAIN INTEGRATED AREA and EXAMPLES OF SUBJECT AREAS

#### I. MAIN CHARACTERISTICS OF THE CURRICULUM

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	Madeleine Rohlin		<a href="mailto:Madeleine.Rohlin@od.mah.se">Madeleine.Rohlin@od.mah.se</a>
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		fax:	46 40 925359

#### *Concept of the curriculum*

The concept of the Malmö curriculum consists of four main principles: self-directed learning, holistic view towards the patient, oral health and team-work (see Figure on title page). The promotion and development of the ability for **self-directed learning** is provided through a wide range of learning experiences. The major part of the curriculum comprises clinical learning experiences and problem-based learning (PBL) with small study-group work and self-studies. Other educational formats such as lectures, seminars, training in skills laboratory and computer-aided learning take place in diverse educational situations to support the main

educational approaches depending on intended goals and objectives. In PBL students' learning is a central principle and students are empowered by having the responsibility for their own learning. The faculty is responsible for making the students sensitive to what learning is and creating favourable learning opportunities and environments. Our educational approach is evidence-based as it builds on activation of prior knowledge, contextual learning and elaboration on knowledge (See Enclosure 2 for an expanded explanation).

Clinical learning experiences begin during the very first year and take up the greatest amount of time in the students' career. The early introduction of clinical experience may be one of the prerequisites for the development of students' interpersonal attributes. In the clinic, the service requirements and patient treatment needs have a significant impact on the range of learning experiences available to students. Prevention, diagnosis and treatment of the most prevalent oral diseases comprise the major part of the students' clinical experiences and high technology care such as fixed prosthodontics is rather common. On the other hand, they will have limited exposure to patients with cysts and tumours and limited experience of some treatment modalities such as tooth extractions and removable dentures. With a long-term exposure to patients the students are helped to develop a focus on the patient as a person rather than just the disease state within the patient i.e. a **holistic view** to care. To promote a holistic view to oral health care, the knowledge and understanding, skills and attitudes of different subject areas are integrated to clinical competence and the allocation to the clinical departments is longitudinal rather than in blocks. This allows a progressive development of the students' clinical competence and the introduction of more complex problems with increasing experience, which comprise an experiential continuum. The development of the competence has a scientific character rooted in research as our educational aim is to produce "reflective practitioners" to borrow Donald Schön's phrase.

To integrate the students to real-life settings, the learning experiences, not only in the clinic but also in the study-groups are based on clinical situations, which demand integration of knowledge and understanding of different disciplines and subject areas. Thus, problems presented to the study-groups include basic sciences and oral health sciences within a structure based on oral conditions prevalent in the community. In the study-group, 6-8 students work through the problems led by a facilitator (tutor). During the 1<sup>st</sup> session a problem is presented in a prescribed form which allows students to define problems, generate hypotheses and determine what individual knowledge is lacking to make informed decisions. After individual searching the student group reconvenes for a 2<sup>nd</sup> session to test the hypotheses, share data and continue the problem-solving process.

Education in **oral health** is the concern of the whole faculty at all levels of the curriculum and not a prerogative of a special course or of a single department. By using conceptual models we repeatedly convey the idea that prevention and treatment of oral diseases aim to establish equilibrium of the processes occurring in the oral cavity. An equilibrium can be achieved by efforts taken on three levels (oral cavity, the individual and society). Treatment, that has a good prognosis necessitates stabilisation of the equilibrium. In the clinical settings it is important for the students to comprehend that oral health care given should have a quality adapted to the needs of the individual patients as a member of a particular society.

**Teamwork** skills are developed through small group work in PBL and in the clinical settings. The importance of collaboration with other health workers particularly dental nurses, dental hygienists and dental technicians is promoted throughout the programme. The first course of

the programme is a 6-week introduction course, together with student dental technicians and student dental hygienists. Dental nurses and dental hygienists are available to assist and instruct the students in the clinical settings. Communication with dental technicians and prescribing to commercial dental laboratories plays a major role during the last two years of the programme. The holistic view to patient care, oral health and team-work are further promoted and developed when the students act as team members in the Public Dental Health Service clinics in county Skåne, during half of the 9<sup>th</sup> and the whole 10<sup>th</sup> semester one day per week.

#### *National goals of undergraduate dental education*

The external relevance of the curriculum is monitored in the Higher Education Ordinance (SFS 1992:1434, 1 kap 9 #) which states:

“.....undergraduate education should besides knowledge and skills, develop the students’ ability to independent and critical judgement, ability to problem-solving and ability to update their knowledge within the discipline which the particular education comprises. The education should also develop the students’ ability for information processing on a scientific level.”

The University Degree in Dental Surgery (DDS) is obtained after the fulfilment of the course requirements of 200 credits. According to the national goals in the Higher Education Act,(SFS 1994:1101, Enclosure 3) the student should:

- have acquired such knowledge and skills that are basic to the dental profession and are needed in order to obtain unlimited licence to practice as a dentist,
- have acquired a comprehensive, medical and social view of the whole individual and his/ her place in the family and in the society,
- be prepared for service within the total remit of oral health care and thereby have the knowledge and skills necessary to be able to apply preventive measures for individual as well as groups of patients; to diagnose and treat diseases and anomalies of the teeth, the oral cavity the jaws and the surrounding tissues in patients of different ages and with different needs,
- understand the relation between, on the one hand, the patients oral health status and, on the other, his/ her general health and other background factors; thereby having learnt to respect the patient’s integrity and developed an ability for empathy,
- be able to co-operate with other personnel in the oral health team; thereby also having received training in the leadership role of the dentist in that team,
- have acquired both health- and care-oriented economic reasoning, and be able to evaluate the undertakings of dental clinics with special regard to aspects of quality assurance.

#### *Goals of the Malmö Curriculum*

Besides the national goals and the objectives specified in the course plans, there are general goals of the curriculum. These goals are formulated so as to describe the knowledge, skills and attitudes i.e. the professional competence a graduate should be able to demonstrate.

The undergraduate dental education in Malmö should be planned so that the following objectives are achieved:

#### *1. Knowledge and skills*

The graduate should

- a) be competent in diagnostic and therapeutic modalities which are enabling her/him to take on professional responsibilities in primary oral health care and prevention
- b) be able to identify and define oral health for an individual patient and for the society as well as lead and convey care, which is focused on the maintenance of health and functions within the oro-facial region
- c) understand the epidemiology of diseases and disorders to be able to work with preventive measures in groups in oral health care and health care in general
- d) have appropriate understanding in basic sciences to follow the scientific development and be able to apply human-biological scientific information in the clinical situation when taking care of patients with diseases in the head- and neck region
- e) be able to identify her/his learning needs, have the ability for self-directed learning and encourage and lead learning and competence development of members of the oral health team
- f) understand demands which are posed on individuals, institutions and society so that s/he is able to formulate developmental goals of the activity/organisation which s/he is a member of and/or lead
- g) be competent to recognise ways of reacting and to co-operate well with patients and with colleagues and other personnel
- h) be able to interview and examine patients of different ages
- i) be able to make ethical priorities in oral health care (for example concerning the use of methods/materials; treatment of patients of different ages and health states; cultural diversities in health care)
- j) understand and be able to apply principles of organisation and leadership in oral health care
- k) be able to search, elaborate on and interpret basic science, epidemiological and clinical information and apply this information in the clinical situation
- l) be able to communicate orally and in written on information of individual patients and of scientific data
- m) have knowledge on situations in other countries and cultures which are important for handling of oral health care
- n) have knowledge on equality of relevance for her/his future professional role

### *1. Attitudes*

The graduate should demonstrate:

- a) an understanding for patients emotions and life situation
- b) that s/he endeavour to acquire high quality on own achievements
- c) sensitivity and a caring attitude in patient care and in co-operation with colleagues and other health care personnel
- d) a critical stance towards own knowledge, skills and attitudes and be positive towards competence development in the health care sector
- e) a positive approach towards team work and be able to perform as a full team member engaged in education, health care and science
- f) responsibility for own and team members learning and competence development

### *Hours in the Curriculum*

The programme is five years. Each year comprises two 20-week semesters, autumn (September-January) and spring (January- June). The number of sceduled hours increases with

each semester, being between 16 and 32 scheduled hours per week. Total hours in the clinic: 2 597.

### *Courses in the programme*

Each semester is devoted to one course except for the autumn semester of the first year, which comprises two courses (Table). The selection of themes is based on oral conditions prevalent in the community and the themes of the courses direct the context in which learning takes place. The activities in study-groups, skills laboratory classes and in clinical settings are integrated to take care of patients with these conditions and to develop a holistic approach to patient care. Integrated within these activities are basic sciences (such as biochemistry, physiology, behavioural science), medical sciences (such as clinical pharmacology, general medicine, and ENT) and oral health sciences.

The course, “The Oral Eco-system”, during the first semester is devoted to the development of an appreciation of the normal functions of the oral cavity and relating them to the general mechanisms of body function. During the 2<sup>nd</sup> semester, studies of periodontal disorders are followed during the 2<sup>nd</sup> and 3<sup>rd</sup> years by studies of caries and infections in the oral cavity. Education in oral health is the concern of the whole faculty at all levels of the curriculum and not a prerogative of a special course or of a single department. However, a comprehensive approach towards how to identify risks and prevention is dealt with from 4<sup>th</sup> semester onwards. Provision for the development of understanding and skills necessary for more advanced modalities in oral health maintenance such as prosthetic dentistry comes relatively late in the sequence being focused on in the courses during the 6<sup>th</sup> and 7<sup>th</sup> semesters. The last 3 semesters are concerned with comprehensive oral health care viewed from different perspectives, for example care of adolescents and children and care of adults. Orthodontics, paediatric dentistry, different oral health sciences, behavioural sciences and basic biology are integrated in appropriate contexts. During half of the 9<sup>th</sup> and the whole 10<sup>th</sup> semester the students spend one day per week in the Public Dental Health Service to connect learning in the dental school with a real professional context.

Table. The curriculum for undergraduate dental education in Malmö, by year; each year comprises two 20-week semesters, autumn (September-January) and spring (January-June).

September-January <i>1<sup>st</sup> year</i> I. Oral health care in co-operation – an introduction (6 weeks)	January-June Diagnosis and treatment of simple periodontal disorders in adults
II. The Oral Eco-system (14 weeks).	
<i>2<sup>nd</sup> year</i> Diagnosis and treatment of caries of and periodontitis including the function of the stomatognathic system	Prevention, diagnosis and treatment of caries and periodontitis.
<i>3<sup>rd</sup> year</i> Diagnosis and treatment of infections in the oral cavity.	Evaluation of diagnoses and management of oral dysfunction and its treatment.
<i>4<sup>th</sup> year</i> Disorders of the stomatognathic system and prosthetic dentistry	Comprehensive oral health care of children, adolescents and adults.
<i>5<sup>th</sup> year</i> Comprehensive oral health care with a perspective towards the individual. Diseases of the head and neck region relevant to oral health care.	Comprehensive oral health care in perspective towards the society.

## Comments to section 5:

### I. MAIN CHARACTERISTICS OF THE CURRICULUM

#### 1. Strengths

- Empowering of students to achieve intellectual autonomy as well as being trained in a professional context from the very beginning
- Emphasis on students' learning and responsibility for their own competence development. Staff members are facilitators
- We favour an approach that values competence more highly than content and stress critical discriminatory skills and problem solving
- The aim to develop critical skills rather than only concentrating on detailed knowledge and specific skills
- A positivistic orientation embedded in a holistic and integrated approach
- Strong relations between research and education. Intellectually challenging to students and staff.
- Course evaluations and the possibility to continuous development of the curriculum

## 2. Weaknesses

- Some staff members and a minority of students find it difficult to cope with the programme, they want more direction and a more content-oriented and subject-oriented approach. Our approach is intellectually more demanding and likely to identify difficulties in co operation among staff and departments
- This curriculum like other curricula runs a risk of not identifying all relevant issues for future oral health care
- Difficulties to train team work to the extent that we would have wanted to
- Some people *might* consider it to be a weakness that the graduates will not get the “traditional” knowledge structure of different disciplines. Instead the students get a clinical structure which enables them to solve clinical problems.
- The implementation of described objectives in behavioural and social sciences could be improved on and so could the assessment of the students learning outcomes in this area

## 3. Innovations and Best Practices

- A concept for the curriculum with a focus on the students learning as one main principle
- Empowering of the students in many ways and in different settings
- The holistic view with a health orientation
- Contextual learning based on an educational rationale with inter-disciplinary integration, an experiential continuum and meaning-making
- Clinical learning experiences from the very first year and the evidence-based approach throughout the curriculum including the clinical settings
- Assessment and different assessment methods with students self-assessment as an integral part of their competence development

## 4. Plans for Future Changes

- It is recognised that some staff-members will not agree on a curriculum, whether traditional or PBL-based. However, we will continue through discussions at the level of the curriculum, course and sections of courses to deepen understanding and commitment to enable our students to become self-directed in their learning.
- To minimise the risk of not identifying relevant issues we will further strengthen the review discussions on the curriculum.
- We plan to improve on the activities that are provided for the development of competence in team work
- Research together with other PBL-oriented health education programmes to analyse the graduates knowledge structure and how they apply their knowledge in problem solving in oral health care
- To improve on the integration of behavioural and social sciences with other disciplines, in particular in the students clinical learning experiences



## **II. DESCRIPTION OF THE CURRICULUM AT THE COURSE LEVEL**

Below the curriculum is described at the course level in the form of a complete course plan of one course in the beginning (Course 2) of the curriculum. Such a plan is given to each student on her/his first day of that particular course. Two other course plans of one course in the middle (Course 5) and one in the end (Course 9) of the curriculum are enclosed (Enclosures 3 and 4, respectively).

MALMÖ UNIVERSITY  
Centre for Oral Health Sciences  
Undergraduate Dental Education  
Course 2, 1998

Curriculum

for

**Undergraduate Dental Education**

**COURSE PLAN FOR COURSE 2**

**Diagnosis and Treatment of Simple Periodontal Disorders in Adults**

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## **COURSE LEVEL AND CREDITS**

Course 2 is a part of the undergraduate dental education and comprises 20 credits at the level 20-40 credits, out of the total 200 credits of the undergraduate education. 1 credit is equal to one week.

## **AIM AND OBJECTIVES**

The aim of the course is that students should be competent to take care of adult patients with simple periodontal disorders with regard to prevention, diagnosis and treatment on the basis of their knowledge, and its application, skills and attitudes in basic biology, medicine, oral health sciences and behavioural sciences. The following objectives are to be attained:

### **Knowledge Objectives**

The student should

- understand how the barrier functions of the oral tissues are maintained
- understand the development and consequences of inflammatory reaction
- describe how the inflammatory reaction is regulated
- explain how antibodies gain their specificity
- understand the metabolism of bone tissue
- explain how oral tissues can be repaired
- explain the formation of an X-ray image
- explain the biological effects of radiation
- explain the mechanisms underlying pain
- describe the mechanisms of local anaesthetics
- describe anatomical structures of importance for local anaesthesia
- be oriented about the prevalence, aethiology and pathogenesis of diabetes
- understand how diabetes can influence processes in the oral cavity

### **Skills Objectives**

The student should be able to

- analyse and practise dentist-patient relationships
- diagnose diseases in the periodontium
- assess different methods for diagnosing disease in the periodontium
- perform and interpret bite-wing radiographs for the diagnosis of periodontal disease
- inform and instruct an adult patient with periodontal disorders

- perform professional tooth cleaning and scaling
- induce local anaesthesia in the oral cavity

### **Attitude Objectives**

The student should

- exhibit a comprehensive view in diagnosis and treatment of periodontal disorders
- reflect on the patient-dentist relationship
- strive to minimise the X-ray dose to the patient and staff

### **CONTENT**

The content and the time sequence of the course is presented in Figure on page 33. The intention of the course is the study of prevention, diagnosis and treatment of gingivitis and simple periodontitis in adult patients using an oral eco-system concept. Diagnosis and treatment of patients with these conditions presupposes the application of knowledge and skills in local anaesthesia and bitewing radiography. Communication skills are continuously trained and the student gain insights into the patient-dentist relationship. Both clinical experience and the discussions in the study-groups stress a sound biological understanding of good oral health and hygiene and its relation to prevention, and importance of good communication between student-dentist, patient and auxiliary staff. Students are provided with optimally timed clinical experience after they have performed training of the same procedures in the skills laboratory. Strong emphasis is placed on whole patient care from the outset. During this course an understanding is developed of one prevalent human disease, diabetes, that is required for a dental practitioners to safely care for patients and realise the relationship between general and oral health.

### **LITERATURE**

In problem based learning curricula, mandatory literature is not provided. Proposed literature is offered in the supplemented literature list.

### **ENTRANCE REGULATIONS**

The student must have participated in both courses during the first semester, “Introduction course” and “The Oral Eco-system”.

### **EDUCATIONAL FORMATS**

Study-groups, seminars, skills laboratory and clinical tasks are mandatory.

### **Study-groups**

A study-group consists of eight to nine dental students and one facilitator. Problem-based learning comprises the educational format in the study-group. In the course, cases or problems

of clinical significance make the starting-point for learning. All study-groups work with several themes within this course. The objectives of the course are the guidelines for the studies. Groups meet twice a week for a 3 - 4 hour period as scheduled.

### **Lectures**

Lectures are given on suitable topics during the course. The lectures demand generally that the students have gained basic knowledge in order to benefit from the lecture efficiently. As a principle, resource persons on the initiative of the students can give extra lectures.

### **Seminars**

Seminars are held regularly during the course. Several discipline specialists (resource persons) form a panel to guarantee a holistic approach and sufficient depth. The seminars are student centred which means that the content is directed by questions formulated by the students. The questions are prepared and written in the study groups and delivered to the resource persons three days in advance.

### **Self studies**

The scheduled time varies between 16 and 30 hours per week during course 2. The remainder of the time is planned for self-studies. Suggested reading can be found in the literature list.

### **Clinical Settings**

Clinical learning experiences include diagnosis and treatment of adult patients with simple periodontitis. Experience of treatment under local anaesthesia is performed during the second half of the course. The clinical work is performed during 1-3 half days a week.

### **Skills Laboratory**

The students will practice periodontal treatment with scaling in a skills laboratory, bitewing radiography and local anaesthetics immediately followed by the implementation of these skills in clinical practice the same semester.

## **ASSESSMENT OF STUDENT PERFORMANCE**

Assessments are made using theoretical and practical tests and include

- continuous (formative) assessment
- written and oral assessment (summative assessment).

Components in the clinical settings and in the skills laboratory are compulsory, comprise mandatory participation and continuous assessment is made. Contributions during study-groups and seminars are also assessed. Self-assessment is an important part of the formative assessment.

The summative course assessment comprises aspects of the studies of the whole course. Both written and oral assessments are used and the assessment of problem solving and reasoning skills are especially emphasised. Objectives from the previous courses can also be examined. For admittance to the summative assessment active participation in mandatory components of the course and adequate clinical practice is demanded.

Students who are repeating the course for a second time must retake the whole assessment and pass all areas.

### **COURSE EVALUATION**

As a part of the final assessment each students make a written course evaluation and each study-group meet the assessment co-ordinator for an oral course evaluation.

### **MARKS**

Pass or fail.

## **II DESCRIPTION OF THE CURRICULUM AT THE COURSE LEVEL**

### **1. Strengths**

- Congruent and transparent presentation of all 11 courses to the students and the staff
- A general goal is defined for a comprehensive course and so are corresponding objectives so that a holistic view can be promoted also at the course level
- The clinical situations i.e. the “real life situations” form the basis for students learning experiences and competence development
- Ensurance of a comprehensive approach on the course level between and within different disciplines and subject areas
- The provision of learning in different educational formats like in the clinical settings, study-groups, skills laboratory and seminars is integrated

### **2. Weaknesses**

- Some objectives are expressed in a way that the students do not comprehend them
- In some sequences of few courses there is too little studying time and time for reflection
- Some problems presented to the students are not optimal

### **3. Innovations and Best Practices**

- A theme based on common oral conditions, their prevention, diagnosis and management comprises the basis for the course
- A group (course-group) consisting of a course co-ordinator and 3-4 persons from different subject areas plans and implements the actual course in order to achieve an integration of different areas.
- The course-group presents an explicit course plan with description of aims, objectives, content, assessment methods to the students and discuss the plan with the students on the first day of the course
- Integration of different learning activities like in the clinical settings, seminars and skills laboratory throughout the courses
- The seminars, which are based on the students questions and are multi-disciplinary with 2-4 individuals representing different disciplines/subject areas. This sort of discussions will also contribute to the faculty’s increased knowledge and comprises in this way faculty development
- A summative course assessment completes the 20-week-course. An assessment group, which consists of a co-ordinator not involved in the actual course and 3-4 other persons, plans and executes the summative course assessment.

### **4. Plans for Future Changes**

We are continuously improving the courses according to the course evaluations. The development of better and more comprehensible objectives is one of the main areas. We are considering expressing the objectives in the form of competence and/or as learning outcomes. Another field for improvement is the refinement of problems in some areas.

## 5. Visitors Comments on Curriculum

### 5.1 Curriculum in general

The curriculum of the Malmö dental school is based on four concepts

- oral health
- holistic view
- teamwork
- self directed learning

These concepts result in the following program- characteristics:

In each of the ten semesters a course is designed integrating all the necessary disciplines: basic sciences, clinical sciences, behavioural sciences and medicine.

The students study theory on the basis of problems, one per week, in study groups, supported by facilitators (staff-members trained to mentor students).

The problems are designed in such a way, that the students are touching upon all of the relevant issues. Planning is carried out by experts which are representative of all of the disciplines involved.

Students are guided in studying and acquiring knowledge by stated objectives, guidance by the facilitators and seminars where experts answer questions.

The assessment is strongly related to both the theme of the course and the learning philosophy underlying the curriculum.

- The objectives of the curriculum are clear, as is the implementation of the learning/teaching philosophy.
- essential for the curriculum is the placement of all relevant subjects in the context of oral health problems at the appropriate level: clinical science, basic sciences, medicine
- evaluations take place, which already has led to modification of the program.
- All courses are based on co-operation of experts from relevant disciplines, the course 'the Oral Ecosystem' is an outstanding example of this approach.

The approach to the curriculum in the first semester causes anxiety among some students but they adjust rapidly to this. Initially it is not easy for an outsider to get an insight into the subjects and the exposure of the students. The objectives stated per course are too broadly defined to provide such an insight.

From the competency-questionnaire given to students it appears that prosthodontics and minor surgery are only experienced by students to a limited degree. However, we have been informed that some of these items in the questionnaire (especially items #12 and #15) do not reflect realistic treatment modules in Swedish prosthetic care.

The teaching- and learning process relies heavily upon teachers, facilitators and students through self-assessments and assessments of the staff.

The overall programme is innovative and the experience gained in the initial years produced a number of modifications resulting in a comprehensive programme for current students. Staff continue to enhance the programme and students are clearly involved in the process.



### **III. DESCRIPTION OF MAIN INTEGRATED AREA and EXAMPLES OF SUBJECT AREAS**

Below we describe six main areas of our curriculum, which comprise integrated subject areas. The main areas (Basic Biology, Medicine, Comprehensive Care of Children and Adolescents, Comprehensive Care of Adult Patients, Behavioural and Social Sciences and Student Research Projects) are described according to the DENTED protocol. Selected subject areas are described concerning the timing in the curriculum, the primary aims and main objectives. As consistent formats for learning/teaching and assessment methods are implemented throughout the programme, these issues are not elucidated in each separate description of the subject areas. For the description of strengths, weaknesses, innovations and best practices as well as plans for future changes the reader is referred to the descriptions of main integrated areas. The outlines of the following section, where the numbers refer to the numbers in the DENTED-protocol, are as follows:

- Main integrated area: **BASIC BIOLOGY** in the curriculum  
 Subject area:  
 5.1 – 5.3 Cell Biology (Biochemistry, Molecular Biology, Genetics)  
 6.1 Anatomy  
 6.2 Physiology  
 6.3 Histology and Oral Histology  
 7.1 Pharmacology (Clinical Pharmacology)  
 7.2 Microbiology and Oral Microbiology
- Main integrated area: **MEDICINE** in the curriculum  
 Subject area:  
 8.1 Internal Medicine (General Medicine)  
 8.2 Ear-, Nose- and Throat Diseases (Oto-Rhino-Laryngology)
- Main integrated area: **COMPREHENSIVE ORAL HEALTH CARE OF CHILDREN AND ADOLESCENTS** in the curriculum  
 Subject area:  
 9.1 Orthodontics  
 9.2 Paediatric Dentistry
- Main integrated area: **COMPREHENSIVE ORAL HEALTH CARE OF ADULT PATIENTS** in the curriculum  
 Subject area:  
 11.1 Conservative Dentistry (Basic subject area = Cariology)  
 11.2 Endodontics

11.3 Prosthodontics

11.4 Stomatognathic Physiology

11.5 Oral Technology with Skills Laboratory

12 Periodontology

13.1 and 14.1 Oral Surgery and Oral Medicine

13.2 Oral Radiology

14.2 Oral Pathology

14.3 Oral Diagnosis

15.2 Dental Emergencies

- Main integrated area: BEHAVIOURAL and SOCIAL SCIENCES in the curriculum

Subject area:

16.1 Social Sciences

16.2 Communications

16.3 Ethics and Jurisprudence

16.4 Practice Management

- STUDENT RESEARCH PROJECTS in the curriculum

## **Subsections 5-7**

- **Main Integrated Area: BASIC BIOLOGY IN THE CURRICULUM**

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### **1. Explanation and timing of Basic Biology**

Subjects such as biochemistry, molecular biology and genetics (Section 5 in DENTED-protocol), anatomy, physiology, histology (Section 6 in DENTED-protocol) and pharmacology, microbiology and general pathology (Section 7 in DENTED-protocol) are covered by the collective description – BASIC BIOLOGY. A sound understanding of basic biological concepts is essential in dealing with clinical phenomena and situations and as the basis for decisions concerning diagnosis and treatment of oral diseases. The students learning in basic biology is thus motivated by the need for a scientific basis for prevention, diagnosis and treatment carried out in the clinical settings.

Therefore, basic biology is spread throughout the curriculum in parallel with patient care and students' clinical experience. In order to create an initial basis for continuous learning, many of the basic biological concepts are introduced during the early part of the curriculum while their application to more complex clinical situations is the focus of learning at later stages. For example, cell growth and divisions are studied during courses 1 and 2, whereas tumour biology, a complex situation requiring an understanding of these phenomena, is studied during course 9. The timing presenting the five years of the curriculum and courses and examples of different basic biological issues is presented in Table in page 44.

### **2. Primary Aims**

Primary aims for basic biology learning are that the students should appreciate biological processes which contribute to oral health and understand the development of disease as well as gaining the ability to design prevention, diagnostic and treatment strategies based upon scientific biological principles.

### **3. Main objectives**

The basic biology learning objectives are classified as specific (requiring knowledge and understanding from one discipline/subject area), intermediate (requiring knowledge and understanding from both basic biology and clinical sciences) and general (requiring knowledge and understanding from basic biology, clinical sciences and other sciences). Examples of main objectives at the three different levels are presented on page 45.

### **4. Hours in the curriculum**

Throughout the curriculum, students spend approximately 16 % of their time studying basic biology.

### **5. Educational approaches**

In keeping with the educational approaches used in Malmö, student learning and training is mainly based on clinical experiences and problem-based learning. Clinical problems presented to the students in the clinical settings and in the study groups need explanations in terms of underlying biological processes or mechanisms. Basic biology knowledge is used to explain clinical findings and phenomena and to underpin decisions on diagnosis and treatment of oral diseases.

## **6. Assessment methods**

Assessment of student performance takes place throughout the course with regular feedback from facilitators and clinical supervisors. An examination at the end of each course helps to determine whether each student has reached a sufficient level of understanding of biological concepts and is able to apply them to clinical situations. The assessments emphasise students' ability to use basic biology knowledge in novel clinical situations and to put basic biology information into real life situations.

## **7. Strengths**

The strengths of this approach are that the motivation of basic biology knowledge is high among students. The learning is steered by students 'need to know' rather than by decisions concerning curriculum content made by the teaching staff. Basic biology is learned in the context in which it is used - a factor that has been demonstrated to increase the retention time and the application of knowledge.

## **8. Weaknesses**

One of the difficulties associated with this method of learning basic biology is that, at in the early least stages, objectives may be difficult to identify and may not be directly evident from the literature. This leads to a feeling of frustration amongst the students as to the depth of the knowledge they require. However, this may be overcome through the aid of the facilitators, clinical instructors and/or resource persons. Since those involved most heavily with basic biology are not generally active within the clinic, it can sometimes be difficult to ensure that the links between activities occurring within the study group and in the clinical settings are made.

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

- The Oral Eco-system
- Problem-based approach gives the students the opportunity to learn basic biology in a professional context and in an integrated fashion. Both circumstances are known to improve learning and knowledge application.
- Major innovations made within basic biology include that we do NOT try to cover all knowledge in the basic biology domain but select the content in the form of priority problems. The priority problems primarily consist of oral conditions commonly found in the community or of events that are educationally relevant as they are in need of explanations in terms of underlying processes, principles or mechanisms. The selection of the content of basic biology curriculum is thus based on its clinical or educational relevance.
- Furthermore, we have devised a set of key concepts such as the 'oral ecosystem' to

- promote students learning and understanding (meaning-making) of phenomena and their relation to the context in which they take place.
- Complementary lectures and seminars with experts from both basic biology and clinical sciences are arranged in order to facilitate transfer of basic biology knowledge to the clinical domains and to give frequent qualitative feedback. These seminars high-light the connection between undergraduate education and research which also serves to open the scholarly discourse to the student, inducing them to see arguments for and against standpoints constituting the scientific exchange of opinions and different knowledge structure of basic sciences and their clinical applications.

## **10. Plans for future changes**

We plan to increase the possibility for the students to discuss their patient care and clinical experiences with basic biology resource persons in the clinical settings. This will be emphasised in the later stages of the programme and further develop their understanding for the biological basis of novel diagnostic and therapeutic modalities. This will be achieved through discussions where the transfer of biomedical knowledge is encouraged and allows the students to gain a deeper understanding of their clinical actions as well as providing a base for future personal development in their profession.

## **11. Visitors Comments on Main Integrated Area: BASIC BIOLOGY in the curriculum**

Basic biological sciences are integrated with other areas throughout all five years of the curriculum. Because of the integrated PBL approach, "traditional" basic science subjects are not taught separately, but topics are explored as and when relevant to the specific problems being covered at each stage. In general, we were impressed by the way in which basic biological sciences are integrated with clinic subjects throughout the curriculum, and the levels and range of expertise available through resource persons is impressive in most cases. An important feature of this PBL approach is that students may request further information about any aspect of the biological sciences, when they feel it necessary for their learning.

We noted that the School is planning to develop further the area of oral biology and would encourage such developments.

The visitors had some initial concerns that coverage of particular important topics might be incomplete (for example, some relevant aspects of topographical, cellular and developmental anatomy, or some aspects of pathology) but were informed that adequate resources and/or resource persons were available in each field required. However, we feel that some additional learning resources, such as anatomical models, might enhance the students' learning opportunities.

## **5.1 – 5.3 CELL BIOLOGY (Biochemistry, Molecular Biology, Genetics)**

Senior Lecturer Julia Davies e-mail: Julia.Davies@medkem.lu.se

### **Timing in the curriculum**

Cell biology is integrated into many areas of the courses although the main emphasis is concentrated within semesters 1, 2 and 4.

### **Primary Aims**

The graduates should understand:

- the relationships between cell structure and function, including an awareness of their dynamic nature.
- the cell biological basis of disease and treatment to a level upon which they can build in their future careers as dental practitioners.

### **Objectives**

The graduates should:

- have an awareness of general cell structure and function.
- know about the molecular composition of saliva as well as how its components are synthesised and secreted.
- understand inflammatory responses and wound healing at a cellular level.
- understand how energy balance within the cell is regulated.
- understand how growth and differentiation of cells is regulated under normal conditions and changes which occur in tumour cells.
- be able to critically assess the results of research within the area of cell biology and use such information in judgements concerning new diagnostic methods and treatments.

## **5. CURRICULUM**

## 6.1 Anatomy

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 Senior Lecturer Göran Petersson  
 Senior Lecturer Gunnel Svensäter [gunnel.svensater@od.mah.se](mailto:gunnel.svensater@od.mah.se)  
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### Timing in the curriculum

Throughout the curriculum topographic anatomy is continuously learned in relation to such topics as local anaesthesia (Course 2), interpretation of X-ray images (Courses 2 and 5), spread of infections (course 5) and stomathognatic function (Course 3). It is also learned in connection with the ENT-course (Course 9) body functions such as circulation and respiration (Course 2), homeostasis control systems for the balance of calcium, phosphorus and water and different oral and general diseases.

### Primary Aims

The students should:

- have knowledge in topographic anatomy in order to be able to increase their understanding of oral health, oral disease processes and oral health care
- have sufficient knowledge in anatomy to understand basic phenomena of general diseases which can influence the oral health and oral health care and have an awareness of the relationship between structure and bodyfunctions on all biological levels

### Objectives

The students should have an appropriate understanding of:

- the topographic anatomy of the oral and nasal cavities, sinuses, larynx and pharynx
- the skeletal system , with particular emphasis on the facial skeleton and jaws
- the muscles of the head and neck
- the nerve and blood supply to the head and neck
- describe anatomical structures of importance for local anaesthesia
- anatomical consequences of clinical interventions (anaesthesia, incisions, reconstructions etc. )
- the relationship between structure and etiology and course of disorders in the head and neck

- normal anatomical and pathological findings which are of relevance for the interpretation of the results at clinical and radiographic examinations

## **6.2 Physiology**

Senior Lecturer Bengt-Olof Nilsson

### **Timing in the curriculum**

Physiology is studied primarily during semesters 1 (secretion and cellular physiology), 2 (cardiovascular system, respiration, nervous system), 4 (gastrointestinal tract) and 8 (endocrinology).

### **Primary Aims**

The graduates should have:

- sufficient knowledge of general and cellular physiology to be able to understand a patients medical history
- relevant knowledge of general and cellular physiology to understand physiological and pathophysiological processes in the oral cavity.

### **Objectives**

The graduates should be able to:

- describe how secretion from exocrine glands is regulated on cellular/subcellular as well as whole-body levels
- describe the principal outlines of the nervous system
- explain neuronal and synaptical transmission and how local anaesthetics and other drugs interacts with these processes
- describe structure and function of the cardiovascular and respiratory systems
- understand changes occurring in the cardiovascular system in association with bleeding and fainting
- understand the pathophysiological processes occurring in hypertension, cardiac failure and asthma
- describe structure and function of the gastrointestinal tract and to have knowledge of its secretory, digestive and mechanical properties
- understand the importance of the endocrine systems in regulation of growth and development.



### **6.3 Histology and Oral Histology**

Senior Lecturer Gunnar Warfvinge      e-mail: [gunnar.warfvinge@od.mah.se](mailto:gunnar.warfvinge@od.mah.se)

#### **Timing in the curriculum**

Histology is studied primarily during the first year. It is further integrated into the studies of the subsequent courses of the curriculum to provide a structural basis for the explanations of physiological and pathological events in other subject areas.

#### **Primary Aims**

The graduates should have:

- sufficient knowledge of tissue morphology to give a structural framework to the understanding of normal physiological and cellbiological events and interactions.
- knowledge of normal structure which is necessary for understanding how various pathological processes affect the tissues of the oral cavity.

#### **Objectives**

The graduates should:

- be able to describe the structure and function of various soft and hard tissues
- be able to describe the structure and function of cells in various tissues
- explain how the barrier functions of the oral tissues are maintained and understand the implications of these functions
- be able to describe the pre- and postnatal tooth development and the mechanisms by which it is controlled
- explain how tissues of the oral cavity can regenerate.
- explain how local and systemic factors influence host defence at infections

## **7.1 Pharmacology (Clinical Pharmacology)**

Senior Lecturer Thomas Andersson

### **Timing in the curriculum**

Pharmacology/Clinical Pharmacology is learned and trained as an integrated subject mainly during semesters 2 (general pharmacology, local anaesthetics, adrenergic pharmacology), 4 (xenobiotics and drug metabolism, xerostomia), 5 (antibiotics, antimicrobial agents, drugs affecting coagulation and hemostasis), 8 (sedation in pedodontics) and 9 (management of chronic pain, drugs of abuse).

### **Primary Aims**

The graduates should be able to:

- explain the mechanisms of action, the biological effects and the clinical use of groups of drugs frequently used in oral health care.
- write a legal prescription for a dental patient, evaluate and keep up to date with information regarding the actions, use and side effects of drugs .

### **Objectives**

The graduates should be able to:

- explain the effects of different drugs on adrenergic receptors.
- explain the mechanisms of action and the biological effects of local anaesthetics.
- explain the mechanisms of action and clinical use of antibiotics and antimicrobial agents in oral health care.
- explain the mechanisms of action of peripherally acting analgesics and their use in oral health care.
- have knowledge of methods for analgesia and sedation of children and adolescents.
- have knowledge of therapeutic alternatives for chronic orofacial pain and be able to describe different mechanisms of action for analgesia in acute and chronic orofacial pain.
- have knowledge of the mechanisms of action of drugs of abuse.
- explain disease- and drug-induced changes in hemostasis and coagulation.
- explain how the body deals with xenobiotics (including metabolism of drugs).

- inform themselves of the actions and side effects of drugs.

## 7.2 Microbiology and Oral Microbiology

Senior Lecturer Gunnel Svensäter e-mail: [gunnel.svensater@od.mah.se](mailto:gunnel.svensater@od.mah.se)

### Timing in the curriculum

Microbiology is learned in the context of oral health maintainance (semester 1), diagnosis and treatment of periodontitis (semester 2), prevention of caries and periodontitis (semester 4), treatment of endodontic infections (semester 5), diagnosis and treatment of oral infections (semester 5), transmissible disease and cross infection control in dental practice (semester 9).

### Primary Aims

The graduates should be able to:

- \* take responsibility for giving the patient comprehensive information about the different infections which have been identified in the oral cavity and the treatments which are available
- \* outline the problems of hygiene related to dental care and have an awareness of cross infection control

### Objectives

The graduates should be able to:

- \* understand the characteristics of the human resident microflora and its relationship to the host at normal conditions.
- \* explain how microorganisms can cause disease in humans and be aware of microbial adaptability.
- \* describe the interactions between microorganisms and the infection defence.
- \* explain how infections arise, develop and the main principles for their treatment.
- \* understand how imbalances arise in the oral microflora and the consequences for this on the oral surfaces.
- \* understand the prevailing strategies for prevention of caries and periodontitis.
- \* understand the prevailing strategies for treatment of oral infections.
- \* explain the mode of action of antibiotic and antimicrobial agents and their use within clinical dental practice.
- \* be able to critically assess judgements concerning new methods for prevention, diagnosis and treatment of oral disorders.

## **Subsection 8**

- **Main Integrated Area: MEDICINE IN THE CURRICULUM**

Professor Maria Nilner

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Senior Lecturer Gunnel Svensäter

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### **1. Explanation and timing of Medicine in the curriculum**

Medicine includes several subject areas such as general medicine (internal medicine), general surgery (Section 8 in the DENTED-protocol), dermatology, toxicology, infectious diseases, coagulation disorders, rheumatology, ear-nose and throat, anaesthesiology and oncology. Knowledge, its understanding and application of medical disorders and diseases is of utmost importance for a general dental practitioner in contemporary practice. In the study-groups students have the possibility to elaborate on problems where prevalent or severe general disorders and diseases influence individuals oral health or the care of a dental patient. In each course one general disease, common in the Swedish population (diabetes, cardiovascular disorders, etc.) or of relevance for the oral health care (disorders in coagulation or immune defence, transmissible diseases) or of educational expediency (nutritional disorders, inflammatory and degenerative diseases) is used as a trigger for a deep approach to learning demanding deductive reasoning. Medical problems in the clinical settings of oral health patients, which are endeavoured during history taking, clinical examination and treatment give rise to continuous learning experiences.

Medicine similar to basic biology is allocated longitudinally rather than in defined blocks in the curriculum and in parallel with clinical oral health care. The time sequence of general disorders and diseases is influenced by their relationship to oral conditions. Thus, for example diabetes is learnt together with caries and dietary habits. The timing presenting the five years of the curriculum and courses and examples of different items in medicine is presented in Table on page 54.

### **2. Primary Aims**

Primary aims for the education in medicine are that the graduate should be able to take the patients general health into consideration in contemporary oral health practice and demonstrate an awareness of the interactions between general and oral health.

### **3. Main objectives**

The learning objectives of medicine are classified as specific (requiring knowledge from one subject area), integrated (requiring knowledge from both medicine, basic biology and clinical oral health sciences) and general. Examples of main objectives are presented in the Figure on page 55.

### **4. Hours in the curriculum**

In the whole undergraduate curriculum students spend approximately 12 % of their time studying Medicine.

**Oral Health Care in Cooperation**

**First year**

Life-threatening Conditions  
Respiratory Disorders  
Circulatory Disorders  
Cardiopulmonary Resuscitation

**Diagnosis and Treatment of simple Periodontal Disorders**

**Second Year**

Nutritional disorders  
Diabetes  
Hypersensitivity  
Allergies  
Intoxications  
Psychological diseases

**Prevention, Diagnosis and Treatment of Caries and Periodontitis, including the Function of the Stomatognathic System.**

**Third Year**

Disorders in the Coagulation System  
Infectious Diseases  
Disturbances in the Infection Defence

**Diagnosis and Treatment of Oral Infections. Oral Dysfunctions and their Treatments.**

**Fourth Year**

Muscle and Joint Disorders  
Geriatrics  
Disorders of Growth  
Endocrine Disorders  
Psychological Disorders in Children  
Traumatology

**Disorders of the Stomatognathic System and Prosthetic Dentistry.**

**Fifth Year**

Diseases in the Ear-, Nose- and Throat-regions  
Tumours and Oncology  
Metabolic Bone Tissue Disorders  
Conditions with Chronic Pain  
Neurological disturbances  
Disorders in the blood  
Transmissible Diseases  
Drug Dependency  
Anorexia and Bulimia

**Comprehensive Dental Care.**

**Dental Care of Children and Adolescents.**

## **5. Educational approaches**

In keeping with the educational approaches used in Malmö, student learning and training is mainly based on clinical experiences and problem-based learning. Clinical problems presented to the students in the clinical setting and in the study groups require knowledge and understanding from medicine, basic biology, oral health sciences and behavioural sciences.

## **6. Assessment methods**

Assessment of student performance takes place throughout the course with regular feedback from facilitator, resource persons and clinical assistants. An examination at the end of each course helps to determine whether each student has reached a sufficient level of understanding in medicine and is able to apply it to clinical situations in oral health care. The assessments emphasise students' ability to apply their medical knowledge in novel clinical situations and to demonstrate relevant links between the patients' general and oral health care.

## **7. Strengths**

The strength of this approach is that the motivation of medical knowledge is high in the learning situation. The learning is steered by students "need to know" rather than by decisions concerning curriculum content. Medicine is learnt in the context which it is used- a learning situation that has been demonstrated to increase the retention time for knowledge. Basic biology is connected to the medical studies in order to promote a better understanding of the medical problems and diseases.

## **8. Weaknesses**

One of the difficulties associated with this method of learning medicine is that learning objectives on specific diseases may be difficult to identify. Therefore a group responsible for the content and implications of medicine in dental education has to work on with this. Clinical instructors' level of knowledge is sometimes insufficient to elaborate on knowledge in this domain. Thereby several excellent learning opportunities are missed and the students' approach to learn about general diseases and their biological background can become too superficial.

## **9. Innovations and best practices**

Major innovations comprise the selection of content of the medical field from clinical need. The medical problems and diseases presented in the problems are not only discussed in the study groups but also presented by medical experts in lectures and seminars. The problems include dentistry and medicine. The problems provided in the programme stimulate and demand students to integrate medical and dental knowledge domains. The medical knowledge content is of high relevance as it is chosen in relation to the patients the students are treating in the clinical settings. Medicine is more pronounced in the latter part of the programme and when studying medicine the students have to elaborate on basic biological mechanisms.



## **10. Plans for future changes**

We are planning to use the patients history more extensively when defining more diseases to deepen the students knowledge.

We wish to build on the existing approach of using patient history as a basis for studying human diseases, through greater use of medical experts in close relation to dental clinical situations. This will also enhance the clinical instructors competence in this field.

Cardiopulmonary resuscitation, which is now learnt during the first year, is planned to be repeated during courses 7 and/or 9.

## **11. Visitors Comments to Main Integrated Area: MEDICINE in the curriculum Subsection 8.**

As with Basic Biology, Medical Science topics are integrated throughout all five years of the curriculum. There is a strong group of active and committed resource persons from the Medical Faculty who work closely as a group with Dental Faculty staff in planning the curriculum and the level of co-operation between them was most impressive. This is greatly facilitated by long-standing research collaboration. It is also significant that a PBL approach has been adopted for the medical curriculum in Malmö. Resource persons are involved in seminars and some lectures, when required.

The coverage of medical topics is determined by an appreciation of those specific topics or conditions that are necessary for a dentist in practice to understand. There appears to be no direct, practical assessment of clinical skills in the integrated medical subjects.

It was noted that some staff from medical disciplines either have appointments in or contract with the Dental Faculty and this is helpful for planning and running the curriculum.

## **8.1 Internal Medicine**

Senior Lecturer Stefan Lindgren

### **Timing in the Curriculum**

Internal medicine is integrated during semester 2 (life threatening conditions, respiratory, circulatory disorders and cardiopulmonary resuscitation) and 4 (nutritional disorders, diabetes).

### **Primary Aims**

The students should be able to:

- be responsible for and take into consideration the patients general health and psychosocial situation and to evaluate different conditions of importance for the care of dental patients
- evaluate life threatening situations by having knowledge about respiration, circulation and cardiopulmonary resuscitation.

### **Main objectives**

The students should be able to:

- know about topographic anatomy and its relevance to the development of diseases in respiratory and circulatory regions
- describe the physiological processes respiration and circulation, and how they are effected in clinical situations by pharmaca and diseases
- understand how oxygen is transported and delivered in the tissues
- describe and perform in life threatening situations, which can arise in clinical situations
- understand the importance of nutrition and eating habits
- describe the digestive system and function
- explain odontologic consequences of diabetes and have knowledge about the prevalence, pathogenesis, course and treatment.

## **8.2 Ear-, Nose- and Throat Diseases (Oto-Rhino-Laryngology)**

Senior Lecturer Göran Petersson

### **Timing in the curriculum**

The major part of the education in ear- nose- and throat diseases takes place during the 9<sup>th</sup> semester.

### **Primary Aims**

The students should be able to

- take into consideration ear, nose and throat diseases when taking care of dental patients
- evaluate ear, nose and throat diseases of importance for the care of dental patients.

### **Main objectives**

The students should:

- know about topographic anatomy and its relevance to the development of diseases in the head and neck region
- be able to understand how changes in the maxillary sinuses, salivary glands, throat and nose can affect conditions in the oral cavity and vice versa and about the treatment of such changes
- know how speech is developed and how it is affected by diseases and disorders
- know the most common ear diseases
- know about how the facial nerve can be affected by diseases
- be able to write a referral to specialists in medical fields.

### **8.3 Dermatology**

Professor Bert Björkner

#### **Timing in the curriculum**

The major part of the education in dermatology takes place during the 3<sup>rd</sup> semester.

#### **Primary aims**

The student should be able to:

- be responsible for and take dermatological diseases into consideration
- evaluate dermatological diseases of importance for the care of dental patients

#### **Main objectives**

The student should be able to:

- know about topographic anatomy and its relevance to the development of dermatologic diseases in the head and neck region
- describe the difference between hypersensitivity, allergic and toxic reactions and the mechanism behind these reactions
- know about investigations of patients with deviating tissue reactions caused by dental materials
- understand and demonstrate respect for the patients opinions and wishes.

## **Subsection 9**

### **Main integrated area: COMPREHENSIVE ORAL HEALTH CARE OF CHILDREN AND ADOLESCENTS (ABUT)**

Professor Jüri Kurol

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#### **1. Explanation and timing in the curriculum**

The Public Dental Service in Sweden (Folk tandvården) is responsible for the dental treatment of all children 0 – 19 years of age and the treatment is free of charge. The funding is made by the County Council local parliament, (Landstinget) by taxation. Since the treatment is free of charge practically all children receive their dental treatment within the Public Dental Service. Children who need specialist treatment can also get this from specialists in paediatric dentistry and orthodontics, who are engaged in the public dental health service.

It is the aim that the students gradually during the clinical training period, semesters 8-10, should be able to work with the patients in the same way as they will do when they have finished their studies.

Children in all ages from 3 to 19 are treated. Theoretical and practical knowledge from the basic courses in orthodontics and paediatric dentistry are integrated within the care of one and the same patient. The clinical training is directed towards a gradual independence.

#### **2. Primary aims**

The main philosophy of the clinical course is the comprehensive patient care. It is important to understand and recognise the continuous somatical and mental development for the young individual. Since the faculty is responsible for the total dental care in one school district the students are in a natural way trained to meet, diagnose and treat individuals who have different levels of treatment needs and demands.

#### **3. Main objectives**

The student should be able to examine and diagnose common diseases in children of the hard and soft tissues of the oral cavity, accidental injuries, tooth developmental disturbances, early disturbances of the orofacial development and functional disturbances. It is also important to plan, implement and evaluate suitable preventive and operative measures towards these conditions. The training of examination and diagnosis is for the discipline orthodontics supplemented with specially selected and referred patients from the waiting list of the Public Dental Service for Orthodontic care. Common types of treatments are different activator treatments for Class II Div 1 malocclusion, expansion of the maxilla in cases with crossbites and interceptive early orthodontic care. Thus, the student should be trained to examine, follow different phases of development of patients up to the age of 19 years, plan and also independently carry out common treatment procedures.

#### **4. Hours in the curriculum**

The training in paediatric dentistry starts with the main theory during the 8<sup>th</sup> semester. At this time they also receive their own patients. This means that they can finish the tasks during the 9<sup>th</sup> and 10<sup>th</sup> semester. The time spent treating patients in the clinic for oral health care for children is from 8<sup>th</sup> to 10<sup>th</sup> semester 30, 30, 20 per cent respectively of the total time available.

#### **5. Method of learning/teaching**

The basic principle is problem-based learning. For clinical skills demonstrations are used, for example about how to take impressions and wax construction bites for activators or how to band and deband in the mouth. Also special knowledge is needed of different types of sedation and their effects, developmental disturbances and macro- and micro-morphology of importance for treatment of the teeth.

The maximum number of students in the clinic is 12 (1½ group). The student from the 8<sup>th</sup> semester is observing one student from semester 10 in order to slowly adjust to the child dental health clinic and also to get to know the child and family in case they are going to continue the patient treatment later.

During the clinical sessions at least two clinical instructors are available, one from each of the orthodontic and the paediatric dentistry departments.

#### **6. Assessment methods**

Preclinical tests of the understanding of children and clinical skills are used. A continuous assessment by the clinical staff is performed. Also individual mid-term meetings (with a protocol) are used with each of the students where they receive judgement of their performance and also suggestions for improvement. Theoretical skills are evaluated by summative assessments.

#### **7. Strengths**

One important strength is to meet the child for examination and treatment as one individual. Thereby the orthodontic and paediatric dentistry disciplines are integrated in a natural way. This gives a wide variety of oral conditions during the three semesters with decisions about for example prophylactics, what to do with traumatic injuries and how to treat tooth eruption problems and malocclusions.

#### **8. Weaknesses**

With a specialist organisation within the Public Dental Service, many patients with special needs and treatments are referred and treated at specialist clinics outside the faculty, i.e. handicapped children and cleft-lip and palate children.

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

Exposure to realistic clinical situations in paediatric dentistry during a three semester

period.

Clinical discussions lead by teachers during clinical study groups, which comprise one hour of the four in each clinical session.

Possibilities to join the work at the staff specialist clinic for special treatments like nitrous oxide sedation and full fixed orthodontic appliance treatments.

#### **10. Plans for future changes**

A contact has been established for auscultation of such patient treatments as well as orthodontic-orthognatic treatments for late adolescents and adult patients at specialist clinics.

The integrated child dental health clinic started in 1994 and annual independent evaluations have been favourable and therefore no immediate major changes have been planned.

More use of students self-assessment systems is in progress.

#### **11. Visitors Comments on Main Integrated Area:**

##### **COMPREHENSIVE ORAL HEALTH CARE OF CHILDREN AND ADOLESCENTS.**

Children aged up to 19 are treated, many of them coming from a nearby school. Paediatric Dentistry and Orthodontics are practised together in the same recently refurbished and excellent clinical facilities, students dividing their time approximately equally between these two aspects of child dental care. Students gain experience of treating child patients in the 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> semesters of the course. Students are able to carry out diagnosis, treatment planning and simple treatment on healthy children, but have only limited opportunities to deal with patients with special needs. The course and facilities provided give the students an excellent introduction to comprehensive oral health care for children.

For the future, some further contacts with other Paediatric clinics would be desirable in order to expand the range of the dental students' clinical experience of patients with special needs.

## 9.1 ORTHODONTICS

Professor Jüri Kurol

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### Timing in the curriculum

Orthodontics is an integrated subject area together with Paediatric dentistry during semesters 8 (examination, diagnosis, biomechanical principles related to standard treatment procedures), 9 (treatment need related to different diagnoses) and 10 (diagnosis, finish of own clinical orthodontic treatments).

### Primary Aims

The graduates should be able to:

- explain normal and abnormal craniofacial growth, occlusal development and dental eruption pattern.
- evaluate the need of treatment and assess the proper time for treatment or referral for treatment.

### Objectives

The graduate should:

- be able to perform a clinical examination resulting in a proper diagnosis of the craniofacial and occlusal development and dental eruption.
- be able to understand the significance of disturbances in function, occlusal development and tooth eruption.
- be able to assess the need of orthodontic treatment and give the patient proper advice about consequences with treatment or no treatment, assess the proper time for treatment, duration of treatment and the prognosis of treatment.
- have knowledge about biological and biomechanical principles for tooth movement and jaw orthopaedics.
- be able to perform different standard orthodontic treatments for occlusal disturbances and tooth eruption disturbances.
- have knowledge about the interdisciplinary planning and treatment for special handicapping malocclusions and craniofacial developmental disturbances like cleft lip and palate.



## 9.2 PAEDIATRIC DENTISTRY

Professor Lars Matsson

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### Timing in curriculum

Paediatric Dentistry is taught during 8<sup>th</sup> and 9<sup>th</sup> semesters. The clinical training runs parallel with the theoretical program, integrated with orthodontics in a “general clinic for children and adolescents”. During the 10<sup>th</sup> semester (the first 8 weeks) the clinical training is directed towards a gradual independence. The clinic is organised as a part of the Public Dental Service, and is using the same type of dental records.

### Primary Aims

The graduate should be able to

- describe the normal conditions of the oral cavity during childhood and have knowledge about frequency and aetiology of common oral diseases and other conditions in children, appropriate to the competence of a general practitioner.
- examine, diagnose, plan and implement suitable preventive and operative measures against common oral diseases and other conditions in children and be able to adapt these measures to the child’s somatic and psychological level of development

### Objectives

The graduate should be able to:

- plan and master single or integrated prophylactic measures concerning diet and oral hygiene in combination with the use of fluorides in children and adolescents
- diagnose and treat carious and traumatised teeth, teeth with diseases in the pulp and the periradicular area and teeth with developmental disturbances in the primary, mixed and young permanent dentition
- diagnose and treat periodontal diseases in children and adolescents
- chose anaesthetic and perform injection for block and infiltration anaesthesia with regard to the mental and somatic level of development of the child
- perform routine radiographic examination and be able to interpret images of the teeth and bone in the primary, mixed and young permanent dentitions

## **Subsection 11-15**

- **Main integrated area: COMPREHENSIVE ORAL HEALTH CARE OF ADULT PATIENTS**

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### **1. Explanation and the timing in the curriculum of the clinical courses**

The clinical courses are those within the sections Conservative Dentistry (Basic subject = Cariology), Endodontics, Prosthodontics, Stomatognathic Physiology, Periodontology, Oral Surgery, Oral Diagnosis, Oral Radiology, Oral Medicine, Oral Pathology, Comprehensive Patient Care, Dental Emergencies and Care of Special Need Patients.

The overall principles for the clinical courses as well as for the whole curriculum are *Oral Health, Holistic View, Teamwork* and *Self-Directed Learning*. To facilitate the implication of the principles Oral Health and Holistic View, the Oral Eco-system model was constructed (see article in Enclosure 2). The model highlights the importance of the interactions between society level, individual level and oral cavity for the understanding of oral disorders as well as their prevention, treatment and prognosis and is an important core of the clinical courses. Self-directed learning is implemented mainly in the clinical study-group the last hour of every clinical session in that the students often decide the topic for study and discussion, based on their clinical cases.

The thematic structure of the Malmö curriculum is based on oral conditions prevalent in the community. Such conditions are, for example, caries, periodontal disease, pulpitis/apical periodontitis, partial edentulousness and functional disorders of the stomatognathic system. Themes like these make the contexts in which all kinds of learning are integrated including the clinical practise. The sequence of the themes is planned so that the students gradually improve their clinical abilities. First, students learn how to diagnose and treat simple periodontal disorders. The clinical training starts in the first year (second semester) immediately after a short practice in the skills lab and it is integrated with the theoretical studies. In the second year the students start to practice diagnosis and treatment of caries according to the same principle with practice in the skills lab immediately followed by clinical training and integrated with the study group PBL studies. Meanwhile the students continue the diagnosis and treatment of simple periodontal disorders during the second year. All clinical practice in the Malmö-curriculum is organised according to this structure with gradually more complicated clinical situations like treatments of oral dysfunction including partial edentulousness, coming at the end of the third year and the fourth year.

Different oral diseases and conditions form the basis of the courses, and therefore different treatment modalities like root-canal treatment and tooth extraction are learned in the same course as different ways of treatment of the same condition. This means that there is no separate course in Oral Surgery but different surgical procedures are learnt within the context of them being important modes of treatment. In the same way diagnostic disciplines like Oral Radiology is learned in every course where it makes an important diagnostic tool for the pathologic condition studied.

The second part of the fourth year and the fifth year are devoted to comprehensive dental care where the need of the specific patient in all its complexity makes the basis for training

and learning. This allows a progressive development of the students' clinical competence and the introduction of more complex problems with increasing experience, which comprise an experiential continuum. The learning of areas like Oral Medicine, Oral Pathology, Dental Emergencies and the area of Special Needs Patients are integrated in this course. Regarding the dental care of Special Needs Patients, the students perform treatments of patients with HIV and Hepatitis. Also medically compromised patients and patients with dentofobia are not uncommon in the student clinic. A special group of patients in the student clinic are recently immigrated patients with very limited Swedish vocabulary. Elderly people are frequent patients in the student clinic (10 % of our patients receiving treatment between 1995 and 1999 were over 75 years), which gives the students good experience from this particular treatment group. The Figure in page 71 presents the time sequence of this main integrated areas.

## **2. Primary Aims**

An important aim with the clinical courses is the learning in the context of clinical situations relevant for the oral health situation of the population in question (the Swedish population) and contemporary clinical dentistry. The ultimate aim is to give the students opportunity to develop the competence to prevent, diagnose and treat oral diseases prevalent in Sweden.

## **3. Main Objectives**

The clinical learning objectives are classified as specific (requiring clinical competence within one specific area), intermediate (requiring integrated knowledge, understanding and clinical skills from all relevant basic and clinical sciences) and general (requiring knowledge, understanding and clinical skills from all relevant sciences). Examples of main objectives at the three different levels are presented on page 72.

## **4. Hours in the curriculum**

The odontological clinical sciences are studied and practised from the 2<sup>nd</sup> semester and continues thereafter throughout the programme. They are integrated with basic sciences and medical clinical sciences and make during the second semester 40 % of the time available. This time increases gradually and makes during the 5<sup>th</sup> semester 50 % and during the last years around 70 % of the time available.

## **5. Method of learning**

In keeping with the educational approach used in our programme, student learning is based on the principles of problem-based learning. Clinical problems presented to the students in the clinical setting and in the study groups need explanations on different levels. As for the development of clinical competence, clinical skills relevant for the diagnosis and treatment of the oral disease or condition in question are practised within this specific context. Training of the specific clinical procedures in a skills-lab setting always precedes such clinical practice. Gradually the students develop competence to handle clinical situations with increasing complexity. During the last three semesters the students are expected to give oral health care to patients and handle clinical situations with a high complexity in a comprehensive care setting.

## 6. Assessment methods

Assessment of student performance takes place throughout the course with regular feedback from tutors and clinical teachers. Summative assessment of each course provides a tool to determine whether the graduate has reached a sufficient level of competence.

For clinical procedures in the skills lab and in the clinic, self assessment is focused on. The students use written criteria set by the clinical staff to assess their clinical performance. The clinical instructors give immediate feedback. Requirements for various procedures exist but are more recommendations than rules and are always used in combination with an assessment of the whole clinical performance. Different clinical subject areas like conservative dentistry (cariology), endodontics, periodontology and prosthetic dentistry have defined such requirements. Examples of requirements are:

- *Cariology*: The student should show competence in treatment of patients with caries disease and caries lesions. Furthermore the student should in a test situation independently be able to make diagnosis and restore a tooth with a caries lesion, treatment planning of a patient with caries disease and make a class II filling in a tooth with a caries lesion. A common question is how many times a student needs to practise a clinical procedure to get enough experience. This varies with each individual, but before passing the clinical competence tests the students usually have treated five patients and performed about 20 simple restorations of which at least 10 are class II restorations.
- *Endodontics*: The students' performance in endodontic treatments is continuously assessed in the total oral health care perspective. So are the students' understanding of infection control and certain treatment procedures. To gain enough clinical experience the students are supposed to treat at least one tooth from each major anatomical group (maxillary and mandibular incisors, premolars and molars).
- *Periodontology*: The student has to be able to diagnose and treat various levels of periodontal disease. In the Comprehensive Dental Care Clinic periodontal treatment is integrated in the total treatment plan. Clinical examinations of periodontal disorders are performed in course 3 and are an integrated part of the clinical examinations in course 6 and 9. The clinical understanding, behaviour and skills are evaluated continuously.
- *Prosthetic dentistry*: To be considered competent to perform prosthetic dentistry the student has to be able to adequately plan and execute prosthodontic treatments. During the 7th semester they should be exposed to both fixed and removable prosthodontic treatment modalities. In the comprehensive care clinic, the students should perform prosthetic care as a part of a total treatment. It has to be emphasised that the requirements are not expressed as certain number of prosthetic appliances but the students are continuously assessed in regard to treatment planning and patient treatment.

During each single course (semester) the clinical performance of the students is assessed continuously and the students have to be considered clinically competent to be allowed to take the summative course assessment. In addition to the overall assessment of the clinical performance the subject demands or requirements described above are used for specific integrated subject areas. A more comprehensive assessment of students clinical

competence are performed three times during the programme, at the end of the 3<sup>rd</sup>, the 6<sup>th</sup>, and the 9<sup>th</sup> semester. External examiners are taking part in the assessment after the 9<sup>th</sup> semester. Self-assessment with feedback from the clinical instructor and/or the external examiner is the method used.

## **7 Strengths**

- An important strength of the clinical courses is the contextual concept in which basic sciences and medical clinical sciences are integrated with relevant clinical practice.
- The promotion of a holistic approach to clinical oral health care using clinical situations with gradually increasing complexity is advantageous to the students.
- In the field of Oral Surgery the students get experience both in the student clinic and in the specialist clinic for Oral Surgery in the medical hospital. This allows for a student exposure to a broad spectrum of patients i.e. patients needing implant treatment with and without grafting as well as medically heavily compromised patients and cancer patients.
- The promotion of self directed learning, mainly implemented by means of the clinical study groups.
- The consequent use of self-assessments for the assessment of clinical competence is an important tool for the students' development of their ability to assess themselves in a valid way.
- The student clinics are located in the house and run by the faculty with clinical and academic staff to a certain extent being the same, which facilitates the integration of theory and clinic.
- Most teachers are full-time or half-time staff and are well integrated in the educational and clinical principles of the faculty.

## **8 Weaknesses**

- Team-work is a part of our main principles and as such discussed frequently. Professional dental nurses help and guide the students in the clinic especially with the hygienic procedures. Dental technicians are involved in certain teaching and treatment situations. However, there are limited possibilities for the students to practise clinical situations where the team as such works together in treating patients.
- According to the students course evaluations the holistic approach to patient care as well as the integration of basic science in the clinical situation can improve.
- The selection of patients is not always ideal in that many of our patients have a complex treatment need, which may not be suitable for the learning concept.
- Some parts of the care of special needs patients are not well-developed, especially dental care for handicapped or mentally retarded patients. However, in Sweden there are specialist clinics to care for these patients and it is not considered to a necessary competence in general dentistry.
- Not all students reach the objective regarding minor oral surgery procedures.

## **9 Innovations and Best Practices**

Innovations and good practices that we would like to emphasise are:

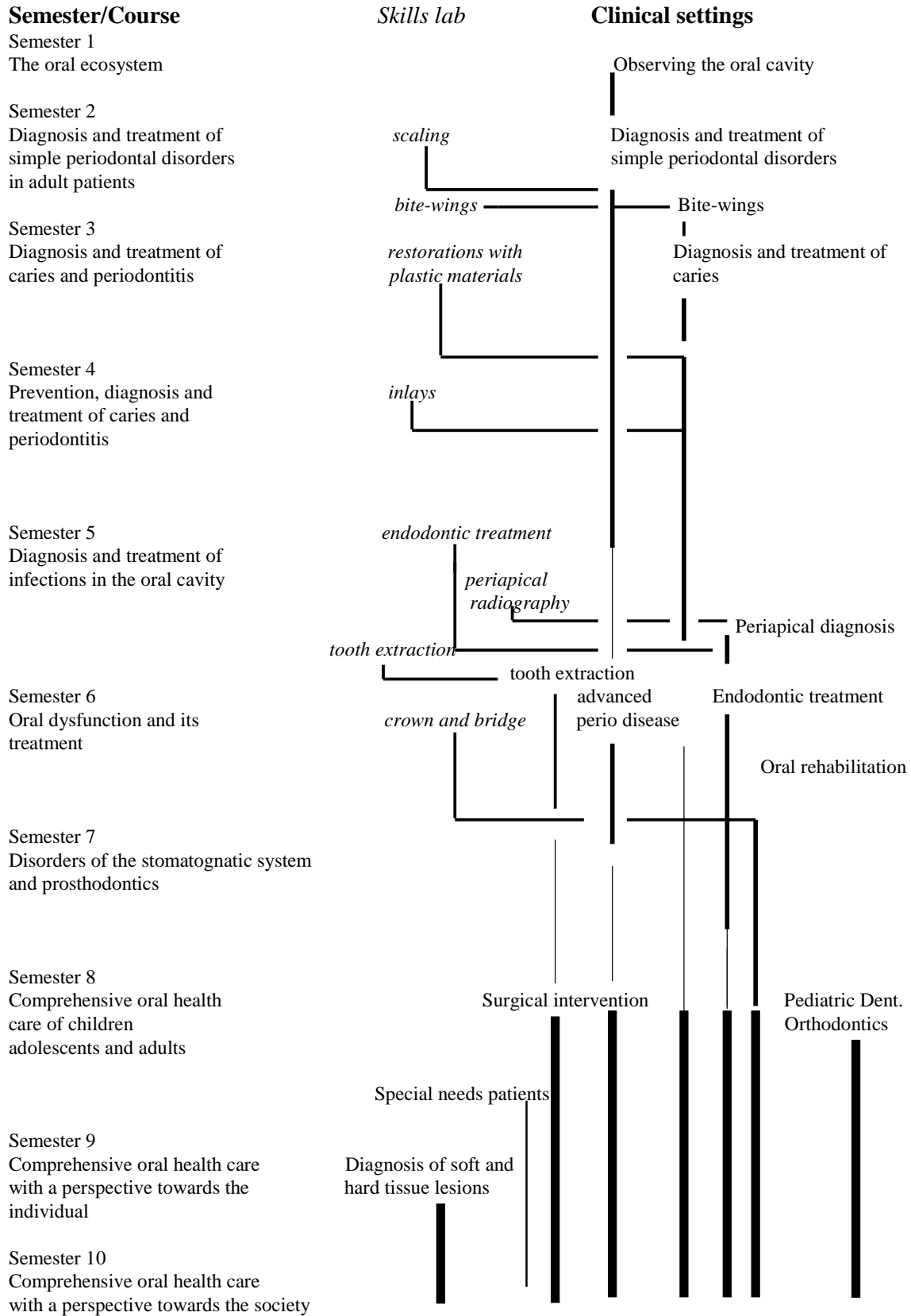
- A spiral curriculum. Such a curriculum begins with simple accounts of a domain of knowledge, well within the reach of the students, and then circles back later to a formal or highly structured account, until the learners have mastered the topic in its full generative power.
- Early exposure to clinical dentistry beginning the first year and making a core to the whole programme.
- The diagnostic competence in caries and inflammatory diseases of the periodontium and surrounding bone tissue is high both regarding the diagnostic procedures and the evaluation of diagnostic methods (diagnostic efficacy).
- The clinical study groups that comprise one hour of each clinical session. During this hour, concepts with relevance to the clinical situation are discussed and the transfer of knowledge between theory and different clinical situations are enhanced. So is self-directed learning.
- The promotion of evidence-based oral health care that is facilitated by the highly qualified staff dominated by teachers with a scientific degree (Odont. Dr.) and/or specialist qualification.
- The practise of and the routines for clinical hygiene are well developed and performed. An important part of this is the nursing staff that is well educated (at least 2 years education) They continuously supervise the students in their training to gain good hygienic routines in all clinical procedures.
- During their last year the students get professional experience from working one day a week in the Public Dental Health Clinics (extramural clinic) and mutual feed back is given at organised occasions.

## **10 Plans for future changes**

Major innovations for the clinical courses are planned mainly for the comprehensive care course. In this course we plan:

- To strengthen the spiral curriculum by enhancing some earlier concepts elaborated, in the more complex clinical situations of the comprehensive care course.
- To better structure the clinical study groups for enhancing the spiral curriculum. Since there are indications that certain clinical practise is not as holistic as could be achieved and that basic science can be better integrated in the clinic, we plan to enhance the holistic approach in the discussions in the clinical study groups. Furthermore, we plan to involve basic science teachers in the discussions in the clinical study-groups to enhance the linking of basic science and clinical dentistry.
- To encourage clinical reasoning especially with regards to evidence-based oral health care and decision making, by means of staff development.
- To arrange opportunities for all students to develop competence in performing minor oral surgery procedures.
- The new dental hygienist education is planned to be integrated with the curriculum of dental undergraduate students. The team-work is to be further developed in the new education.

## ORAL HEALTH SCIENCE SUBJECTS IN THE CURRICULUM



## Sections 11 Integrated /comprehensive patient care & emergency care for adults

### Visitors Comments

In this integrated area all clinical disciplines are brought together: cariology/conservative dentistry, periodontology, prosthodontics, oral radiology, oral surgery/oral medicine, oral diagnosis, emergency care and oral pathology. This area involves a large part of the curriculum: 40-70% of time per semester. The design of the area follows the principle of the 'spiral curriculum'. In the first courses the integrated area 'comprehensive care for adults' is based on simple problems related to caries and periodontal disease. In later courses comprehensive patient care becomes the focus of attention. In all courses theory, skills training and clinical training are integrated.

In the first courses the clinical training takes place in some of the clinical units: cariology, endodontology and periodontology. Later students work in the comprehensive care unit. Treatment planning is practised in the department of oral diagnosis and in the comprehensive care unit. Acute clinical problems are managed in the emergency care unit.

The assessment is largely based on self- and staff-assessment in order to provide continuous feedback. Three times ( in the third, sixth and ninth course) a formal clinical assessment takes place. The students are required to meet a minimum number of treatments. Their progress and the decision to fulfil certain treatments is left to the discretion of the instructor and on the basis that they are competent to practice as a general practitioner.

Although this integrated approach is a great achievement, it is at the same time an area which provides only limited feedback into the actual subjects that the students are exposed to. It would be very helpful if the students' clinical activities would be registered, for example with the use of reflective clinical logbooks. Such data also can be used in discussions about the actual clinical experience of dental students when they graduate. In the Malmö dental school the students seem to get limited experience in minor surgery and in some of the prosthetic treatments such as removable dentures. There are however, ample opportunities to treat patients with fixed prosthodontics.

There seems to be room to expand the team/ comprehensive patient care philosophy. For instance by creating a team of students from different years. In this way younger students would be able to experience more complicated cases earlier in their study, without having to treat them.

With the renovation of the skills-laboratory the relation between this laboratory and the clinic will be strengthened. Improving the simulation of treatments as if they were performed on patients will increase the level of dexterity before going into the clinic. Overall the integration of comprehensive care is carried out very well for the senior students.



## **11.1 Conservative Dentistry (Basic subject area = Cariology)**

Professor Douglas Bratthall

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### **Timing in the curriculum**

The timing is reported below in connection with main objectives.

### **Primary Aims**

- Assess the risk for dental caries and implement proper prevention strategies to reduce the risk, in individuals as well as in populations. These strategies should be based upon knowledge of caries etiology and disease patterns.
- Treat carious teeth using "tooth- and pulp-saving" techniques. Make restorations with appropriate materials that restore tooth form and function and fulfil esthetic aspects.

### **Some main objectives:**

- Understand and describe caries etiological factors and caries pathogenesis – Course 3
- Perform caries risk assessments – Course 4
- Reduce caries risk factors – Course 4
- Perform clinical diagnosis of caries lesions – Course 4 + Clinic for Adult Patient Care (Course 8-10)
- Perform cavity preparations – Courses 3,4 + Clinic for Adult Patient Care (Course 8-10)
- Choose and insert suitable dental materials properly – Courses 3,4 + Clinic for Adult Patient Care (Course 8-10)
- Understand and describe other findings related to the hard tissues of the teeth (such as erosions, disturbances related to tooth development) – Course 5 + Clinic for Adult Patient Care (Course 8-10)
- Understand and evaluate caries epidemiology (on tooth, individual, group and population levels) – Courses 4 and 10

## 11.2 ENDODONTICS

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### Timing in the curriculum

Endodontics is studied and practiced as an integrated subject during semester 5 in the context of *Diagnosis and treatment of infections in the oral cavity*, during semester 6 and 7 in the context of *Oral dysfunction and its treatment* and during semester 8, 9 and 10 in the context of *Comprehensive oral health care*.

### Primary aims

The graduates should be able to:

- Understand the defense mechanisms of the tooth and how these function when infection penetrates the barriers as in the case of caries and trauma. This knowledge makes a base for the understanding of diagnosis, treatment and prognosis of pulpitis and apical periodontitis and how these conditions can be prevented. It also implies that the principle of endodontic treatment should be based on infection control and elimination of bacteria from the root canal supplemented with a complete seal of the root canal to reestablish the barrier function in the tooth.
- Understand the impact on the general health of the individual in symptomatic (acute) or more complicated cases of apical periodontitis and its sequel and how these conditions should be handled.

### Objectives

The student should be able to:

- explain how infections arise, progress and are basically treated
- explain how attack and defence factors can influence each other
- explain how inflammation in the dental pulp, the periapical and the periodontal tissues arise, progress and are treated
- diagnose and treat diseases in the dental pulp, the periapical and the periodontal tissues and evaluate the methods for that
- understand the connection between diagnoses, treatment and prognosis at inflammation in the dental pulp, and the periodontal tissues
- describe the qualities of endodontic medicaments and materials and explain how these medicaments and materials interact with the microflora, the tooth and the surrounding tissues.
- diagnose, treat and prognosticate changes caused by trauma against teeth, jaws and surrounding soft tissues

- diagnose, treat and deal with acute and chronic oro-facial pain conditions

## 11.3 PROSTHODONTICS

Professor Krister Nilner

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### Timing in the curriculum

After the skills laboratory education, organised by the Department of Dental Technology during the sixth semester, and to which the Department of Prosthetic Dentistry contributes with manpower Prosthodontics is learnt as a separate subject area during the 7<sup>th</sup> semester and the first half of the 8<sup>th</sup> semester. From mid-semester of the 8<sup>th</sup> semester through the rest of the curriculum prosthodontics is learnt as an integrated part of the Comprehensive Oral Health Care –Clinic (AVT).

### Primary aims

The main aims are that after completion of this course the student should be able to:

- understand and present different prosthodontic options available for the rehabilitation of the edentulous as well as the partially dentate patients.
- present well supported different prosthetic treatment concepts –both removable alternatives and fixed measures – to maintain and restore good oral health, oral functions, and patient satisfaction during the treatment as well as after treatment completion.

### Objectives

The students should:

- know the compositions and qualities of dental materials used for prosthetic work.
- be aware of and act according to these materials' behaviour in the biological environment.
- know the clinical as well as the laboratory procedures necessary for the fabrication of prosthetic constructions.
- have knowledge of factors influencing the prognosis of different prosthodontic rehabilitations
- know the scientific basis for, technique for and prognosis of different implant systems.
- be able to present considerations necessary for the individual evaluation of a patient's need for and satisfaction with prosthodontic measures

## 11.4 STOMATOGNATHIC PHYSIOLOGY

Professor Maria Nilner

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### Timing in the curriculum

Stomatognathic Physiology is learnt as an integrated subject during semesters 3 (mandibular function), 6 (examination of the stomatognathic system), 7 and 8 (examination, diagnosis, treatment and prognosis of temporomandibular disorders in children and adult patients) and 9 (orofacial pain).

### Primary Aims

The graduates should be able to:

- Explain the relationship between the anatomy and the function of the stomatognathic system incorporating an understanding of temporomandibular articulation appropriate to the competence of a general dental practitioner.
- Evaluate symptoms and signs of temporomandibular disorders and chronic oro-facial pain and to take care of patients with these disorders based on their knowledge of diagnoses, treatment modalities and prognoses of these disorders.

### Objectives

The graduates should:

- Be able to perform a clinical examination of the stomatognathic system.
- Be able to understand the significance of occlusal disturbances in connection to normal function of the stomatognathic system and to temporomandibular disorders.
- Be able to examine, diagnose and make prognoses for temporomandibular disorders.
- Be able to perform different treatment modalities for temporomandibular disorders.
- Have knowledge about different types of chronic orofacial pain.
- Be able to evaluate and understand when and how to refer patients with temporomandibular disorders and oro-facial pain to specialists.

## 11.5 Oral Technology with Skills laboratory

Professor Tore Dérand

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### *Course 3*

primary aims:

- to understand optimal properties of a dental filling material
- to have knowledge of the compositions of plastic dental filling materials and relate them to the properties and clinical function

main objectives:

- to understand possible interactions between filling materials and oral environment
- cavity preparations
- cavity linings and pulp protection
- filling techniques
- precautions for dental personel when handling dental materials
- understanding of needs for waste minimisation and environmental laws

### *Course 4*

primary aims:

- to understand properties of dental materials designed for dental fillings
- to understand possible interactions between dental filling materials and the oral environment

main objectives:

- construction technology of inlays
- different production techniques of inlays

### *Course 6*

primary aims:

- to understand the basic principles of oral rehabilitation with special reference to biological and biomechanical implications of dental materials.
- to understand interactions between dental materials and the oral environment

main objectives:

- technology of crowns, bridges and removable dentures
- knowledge of properties of dental materials and long term clinical service
- composition of dental materials and their properties
- handling properties of dental materials in the production of fixed and removable dentures
- preparation of teeth
- understanding of esthetic and functional expectations in dental rehabilitation

## 12 PERIODONTOLOGY

Professor Rolf Attström  
Senior Lecturer Gunilla Bratthall

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### Primary aim

The student shall be able to diagnose and treat uncomplicated cases of periodontal diseases

### 6 to 10 main objectives and timing in the curriculum

#### *Second semester*

Understand and explain the biology and development of inflammation.

Understand and explain the biology of immunity.

Understand and explain the biology of bone metabolism.

Evaluate different methods for the diagnosis of periodontal diseases.

#### *Third semester*

Describe the anatomy of the permanent dentition and the role of tooth morphology for the development of periodontal diseases.

Describe the anatomical variations of the normal periodontium in bitewing radiographs.

#### *Sixth semester*

Understand and describe the biological principles for periodontal regeneration.

Understand and describe the association between diagnosis, treatment and prognosis for pulpal, periapical and periodontal inflammatory conditions.

#### *Seventh semester*

Describe the variations in oral health over time in different population groups.

Describe the influences of general health, socio-economical factors and behavioural factors on oral health.

#### *Eight to tenth semester*

There are no specific main objectives in Periodontology due to that this course is integrated.

### **13.1 AND 14.1 ORAL SURGERY AND ORAL MEDICINE**

Professor Jan Rosenquist

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#### **Timing in the Curriculum**

Oral Surgery/Oral Medicine is learnt as an integrated subject during semesters 2 (local anaesthesiology), 5 (tooth extraction lab and PBL cases related to infections and bleeding disorders), 8 (in the comprehensive clinic for adult patients-AVT), 9 and 10 (AVT and the Maxillofacial Centre of the University Hospital).

#### **Primary Aims**

After completion of the programme the graduate shall

- have acquired such knowledge and skill which constitute the base of Oral Surgery and Oral Medicine and
- be prepared to practise across the entire spectrum of Oral Surgery and Oral Medicine with knowledge of prevention, diagnosis and treatment of disease and anomalies of the teeth, the oral cavity, the jaws and the surrounding tissues of patients of different age and of different needs.

#### **Main Objectives**

The graduate shall be able to

- assess the general health of the patient and its consequences for possible treatment as well as the need for referral to a specialist
- master local anaesthesia and pain treatment
- extract teeth and perform minor oral surgery procedures
- understand the principles of oral surgery procedures including Implant Surgery, TMJ Surgery and Orthognathic Surgery
- diagnose and treat as well as assess prognosis and consequences of trauma to the teeth and jaws and initially manage patients with jaw fractures
- describe the aetiology, diagnosis, treatment and prognosis of common oral disorders as well as such rare disorders which might be of serious consequences to the patient.

13.2



## ORAL RADIOLOGY

Senior Lecturer Christina Lindh

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### Timing in the curriculum

Oral radiology is learnt as an integrated subject during semesters 2 (bitewing radiographs in the diagnosis of periodontal disease), 3 and 4 (bitewing radiographs in the diagnosis of caries lesions and principles for the evaluation of diagnostic tests), 5 (periapical and panoramic radiographs in the diagnosis of infections), 6 and 7 (radiographic examinations in relation to other diagnostic tests), 8 and 9 (radiographic examinations of children and young adults and radiographic diagnosis of pathological changes in the jaws)

### Primary aims

The graduates should be able to:

- Explain and assess the influence of x-rays on the living organism and means of dose reduction for patients and staff.
- Perform radiographic examinations in the oral region and interpret the resulting radiographs and evaluate the diagnostic efficacy of radiography in comparison with other diagnostic methods.

### Main objectives

The graduates should be able to:

- Perform and interpret bitewing radiographs for the diagnosis of periodontal disease and caries lesions.
- Perform and interpret periapical and panoramic radiographs for the diagnosis of infections in the oral cavity.
- Explain the production of X-rays and the interaction of X-rays with matter and the living organism.
- Explain radiographic image quality and its influence on diagnostics.
- Explain selection criteria for radiographic examinations in the oral region.
- Evaluate the efficacy of the radiographic examination in comparison with those of other diagnostic tests and its relevance for diagnosis, treatment decision and prognosis.

## 14. 2 Oral Pathology

Professor Åke Larsson

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### Timing in the curriculum

Pathophysiological mechanisms are studied throughout the curriculum.

Particular emphasis is placed on oral pathology predominantly on the 9<sup>th</sup> semester.

### Primary aims

- students should acquire a working knowledge of the clinicopathologic aspects of the more common and important oral conditions found in (Swedish) patients
- students should acquire a basic understanding of oral disease pathogenetic processes as a means to understand the role of biopsy as a clinical diagnostic working tool

### Main Objectives

- understand the cause and development of tumors
- have knowledge about mechanisms of oncogenesis
- know about clinical and paraclinical methods for the diagnosis of premalignant and malignant changes
- explain the consequences of tumor disease and know about incidence, pathogenesis, natural course and treatment
- account for the following aspects: etiology, diagnosis, treatment and prognosis of common oral diseases and of such rare diseases, which may have severe consequences to the patient
- know about different biopsy techniques and about radiologic examinations performed in specialist clinics
- know about the prevalence and degree of severity of oral disease in the Swedish dental population under different conditions
- explain the relation between the distribution and severity of oral disease and the diagnosis and treatment

### **14. 3 Oral Diagnosis**

Senior Lecturer Sigvard Åkerman      e-mail: sigvard.akerman@od.mah.se

#### **Timing in the Curriculum**

Oral diagnosis is integrated during semester 1 (auscultation), 2 (how to hand the clinical equipment, fundamentals of interview), 5 (examination, diagnosis, in integration with oral radiology) and 8, 9 and 10 (examination, diagnosis and treatment planning).

#### **Primary Aims**

The graduates should:

understand the significance of interaction with the patient with aid of communication, the basis for clinical examination and different diagnostic methods, identification of disease and the prerequisite for therapy and be able to diagnose and plan the treatment

be able to evaluate clinical examination methods and different diagnostic methods

#### **Main Objectives**

The graduates should:

have knowledge of basic principles for clinical examination

know how to identify oral disease and be familiar with the prerequisites for the therapy

be able to communicate with the patient based on mutual understanding between clinician and patient

be familiar with Swedish and EU regulations/rules and laws concerning keeping and handling of patients notes as well as administrative routines for dental insurance

be able to describe different diagnostic methods used in dentistry

be able to make judgements about patient information which are of importance for dental treatment

be able to describe the distribution and severity of oral diseases and their diagnosis and treatment

know how to refer patients within dental and medical specialities and the division of responsibility between referring and the receiving of health care professionals

be able to analyse the patient subjective treatment needs, be able to design a therapy plan based on diagnosis, prognosis and the expectations of the patient

## 15.2 Dental emergencies

Senior Lecturer Kerstin Petersson e-mail: kerstin.petersson@od.mah.se

### Timing in the curriculum

Dental emergencies are practised as a part of the Comprehensive Care Course in semester 8, 9 and 10. However, the learning on different emergency conditions starts earlier with for example toothache and more severe tooth infections in the context of Course 5 *Diagnosis and treatment of oral infections and inflammations*, repeated in the clinical context in the Comprehensive Care Course according to the ideas of the spiral curriculum.

### Primary aims

The graduate should be able to:

- Within a holistic perspective take care of an emergency patient. Diagnose and treat patients with conditions like painful tooth infections/inflammations and other common oral infections as well as patients with non functional tooth restorations or prosthetic reconstruction.
- Within a holistic perspective diagnose and handle less common oral emergency conditions like TMJ-disorders and chronic oro-facial pain as well as dento-alveolar trauma.

### Objectives

The students should be able to:

- explain how infections arise, progress and are basically treated
- diagnose, treat and deal with acute and chronic oro-facial pain conditions
- diagnose, treat and/or deal with traumatic injuries against teeth, jaws and surrounding soft tissues
- diagnose, treat and/or deal with non functional prosthetic reconstructions
- know when and how to prescribe drugs necessary for treatment of oral infections and/or inflammations
- know when, how and where to refer an emergency patient for further diagnosis and treatment
- Perform cardio-pulmonar resuscitation

## **Subsection 16**

- **Main integrated area: BEHAVIOURAL AND SOCIAL SCIENCES in the curriculum**

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### **1. Explanation and timing in the curriculum**

Clinical applications of applied subjects in Psychology (i.e. individual-, developmental-, clinical-, social-, educational- etc) and Social Sciences (i.e. sociology, political science, economics etc) as well as Ethics are covered by the collective description - Behavioural and Social Sciences. The timing in the curriculum and examples of different issues are presented in the Table below.

The need for Behavioural and Social Sciences in the undergraduate curricula in all health care educations has become increasingly obvious. These domains include aspects of the individuals social and personal development, attitudes and communications skills with particular emphasis on ethics in the early clinical years and patient communication in later clinical years. The facilitation of information transfer to and from the patient/dentist are vital issues in ensuring appropriate patient management and treatment. Successful outcomes in patient care and risk management when measured in terms of patient satisfaction or litigation, may also depend heavily on the interpersonal and communication skills of the clinician dealing with the problem. Students are provided with opportunities to learn these vital skills throughout the programme.

### **2. Primary Aims**

The graduates should be able to:

- critically evaluate socially determined factors such as patient satisfaction, dental care systems, and the social components of dental diseases. In addition, the graduate should understand some of the basic methodological rules for conducting social research.
- understand basic factors influencing the dentist-patient relationship as well as factors influencing decision making in oral health care
- develop life skills and attitudes which will maximise their educational experiences as undergraduates.

### **3. Main Objectives**

The graduate should:

- understand factors affecting communication with the patient, the dental team and others for the treatment significant persons (e.g. parents), or authorities (e.g. social welfare services department)
- understand different approaches to knowledge and learning
- understand the concept of patient satisfaction
- be aware of influential factors in the context of clinical decision making
- understand the concepts of need and demand of dental care
- understand cultural, political and economic factors influencing oral health and dental care
- understand the role of legality and ethics in dental care

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

Several issues are integrated in the various clinical topics starting in the 2nd semester and in the tutoring of student research projects. Community Dentistry and Behavioural Sciences are integrated and is regularly introduced during the semesters as shown in Table. In the curriculum students spend approximately 6 % of their time studying Behavioural and Social Sciences.

### **5. Educational Approaches**

In keeping with the educational approach used in Malmö, student learning is based on the principles of problem-based learning, which in itself presents training in communication and awareness of the importance of psycho-socio-cultural factors. Clinical problems presented to the students in the clinical setting and in the study groups need explanations in terms of underlying psychological, social and cultural processes and mechanisms. Applied knowledge in social and behavioural sciences is used to explain clinical findings and phenomena and to underpin decisions on diagnosis, treatment and prognosis of oral diseases.

**First year**

Ethics  
 The Dental Team in Sweden  
 Laws and Rules in Health Care  
 Dental Health Profiles

Communication  
 Individual psychology  
 Legal aspects of Oral Health Care  
 Behavior at Pain and Fear

**Oral Health Care in Cooperation****Diagnosis and Treatment of simple Periodontal Disorders****Second Year**

Communication  
 Social Psychology  
 Compliance and Ethics  
 Behavioral Disorders

**Third Year**

Health Care Quality  
 Life Quality  
 Clinical Decision Making  
 Dental Insurance System

**Prevention, Diagnosis and Treatment of Caries and Periodontitis, including the Function of the Stomatognathic System.****Diagnosis and Treatment of Oral Infections. Oral Dysfunctions and their Treatments.****Fourth Year**

Communication  
 Expectations  
 Trust  
 Behavioral disorders  
 Relationship between dentists and children in Health Care Situations  
 Health Promotion Attitudes  
 Psychology of children

**Fifth Year**

Authorities in Health Care  
 Cultural Diversity  
 Communication  
 Structure of Health Care System  
 Ethics  
 Professionalism  
 National and Global Perspective of Oral Health

**Disorders of the Stomatognathic System      Comprehensive Dental Care.  
and Prosthetic Dentistry.  
Dental Care of Children and Adolescents.**

## **6. Assessment Methods**

Assessment of student performance takes place throughout the courses with regular feedback from facilitators, clinical instructors and experts (resource persons) in seminars in a number of formats. As a part of the assessment of the student performance, a "two-way evaluation" is performed each semester. Based on self-assessment by the student and a student assessment by one or two teachers, the performance is discussed with each student separately. Important parts in these discussions are the student's development of self confident, his/her ability to communicate with the patients (and parents) and the level of professionalism in his/hers behaviour in the clinic. An summative assessment at the end of each course/semester helps to determine whether each student has reached a sufficient level of understanding of behavioural and social concepts and is able to apply them to clinical situations. The assessment emphasise student ability to use behavioral and social knowledge in real life situations like in the meeting with patient, personnel and in the study group. This is analysed in feedback situations and in the clinical settings. A particular part of clinical assessment-tests which are similar to OSCE (Objective Structured Clinical Examination) assess the students communication with patient and dental nurse.

## **7. Strengths**

Both the clinical setting and the PBL approach is well suited for learning experiences of these domians. Efforts are made to integrate behavioural science in the early clinical training.

The construct of the oral eco-system-model is connected to the whole individual as a person and to his/hers social and cultural environment in the construct of the psycho/socio/cultural model.

The programme is adapted to the situation that meets the student outside the dental school.

The introduction of Problem-Based Learning has facilitated the incorporation of principles of practice management in a structured progressive learning process with reference to the students' stage of development.

According to students evaluation graduates are very satisfied with their training in oral and written communication

The inclusion of ethics as a string in the undergraduate programme encourages the students to develop their views on ethics/law issues throughout their training. Research work from



Canada and the U.S. shows that health care students are most responsive to ethical problems in their 1<sup>st</sup> year.

## 8. Weaknesses

We are well aware of that the current implementation as shown in the Table above is not fully operationalised. This is because this part of the programme is more difficult to implement than other parts. Students are not always to be highly motivated for this domain and find it difficult to grasp. Teachers have got the same problem. Efforts are now made to present a high educational quality and to secure continuity during the whole programme. However, during the last two semesters their comprehension of these subjects improves.

### 1. Innovations and Best Practices

The behavioural sciences in the curriculum are reinforced by the use of the bio/psycho/socio/cultural approach. Evaluation has been made by a multi disciplinary group in order to guarantee the integration of behavioral and social sciences with biological and clinical sciences.

### 2. Plans for Future Changes

Building on the proper evaluation made two years ago we suggest

- development of laboratory settings using video recordings and role play as natural integrating means of study group work and clinical patient care
- considering ways to strengthen the links between theory and practice

## Visitors Comments

### Main Integrated Area: BEHAVIOURAL AND SOCIAL SCIENCES

The integrated area of behavioural and social sciences includes applied (dental-relevant) aspects of Psychology, Sociology, Ethics and related subjects, seeking to relate these at the level of society, the population and the profession, as well as considering the individual patient, the dentist and the authorities. There is clear recognition of the increasing importance of this integrated area of learning within the dental curriculum, and there is an active group of staff, including behavioural and social scientists as well as dentists, who are planning and acting as resource persons for this aspect which occupies approximately 6% of the curriculum time.

Topics are integrated throughout each of the five years of the course, emphasising ethics in the early years and patient communication in the later stages. Although students are introduced to ideas about practice management during their visits to the Public Health Service during the fifth year, the more financial and business-management aspects are not included specifically in the curriculum.

Teachers and curriculum planners aim to increase further the integration of behavioural and social sciences within the curriculum, including possibly more use of role-play as a learning method. It is acknowledged that some students are more highly motivated than others towards these aspects of the curriculum, but that communication skills, in particular, are seen to become more relevant as the students progress through the course. The school is particularly well-placed to develop these aspects of the curriculum as there are specific academic posts in relevant subjects.

## **16.1 Social Sciences**

Professor Björn Söderfeldt

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### **Background and timing in the curriculum**

Elements are specially emphasised during 1st semester (Introduction to dental care in society), semester 3 (ethics and research methods), semester 4 (dental care need and demand), semester 5 (research methods), semester 7 (patient satisfaction, ethics, the Swedish care system) and semester 10 (social research methods, care and insurance systems in Europe, ethnicity/culture/ethics in dental care).

### **Primary aims**

The graduate should:

- understand the importance of socially and culturally determined factors that affect oral health, oral diseases, dental treatment and dental care systems
- understand the basic rules and methods in conducting social research of importance for dentistry

### **Main objectives**

The graduates should:

- understand the concept of patient satisfaction
- understand the socio-cultural context of decision making in the clinical encounter
- understand the concepts of need and demand of dental care
- understand the influence of cultural, political and economic factors in dental care in EU
- understand basic concepts and methods in social research related to dentistry

## 16.2 Communications

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Professor Madeleine Rohlin

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### Timing in the curriculum

Communication, as a general aspect of competence to be developed is learnt and trained as an integrated subject in different learning situations at different levels of student experience. In the study group communication with peers is trained from the very first week. During the 2<sup>nd</sup> course, communication with patients starts and then continue during all courses. The skills of written communication are developed throughout the whole curriculum but are particularly emphasized in student research projects during the 3<sup>rd</sup>, 5<sup>th</sup> and 10<sup>th</sup> semesters.

### Primary Aims

The students should be able to:

- express themselves in speech and in writing in relation to the subject and in relation to the audience such as a group of peers, a professional context or in public
- communicate with their patients in a meaningful way and with other health workers in particular with the members of the oral health team

### Main Objectives

Some of the objectives are that the students should:

- have knowledge about information transfer and how it can be influenced
- be able to act as a chair person in a group in a way that enables interaction
- develop interpersonal skills so as to handle situations that may arise during their dealings with individual patients
- be able to demonstrate effective communication skills in the oral health team
- be able to present oral and written information that address a variety of audience such as colleagues within health teams, individual patients or the public
- be able to use various media for communication on oral health matters
- be able to use different communication tools such as IT

### 16.3 Ethics and Jurisprudence

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 Senior Lecturer Sigvard Åkerman e-mail: [sigvard.akerman@od.mah.se](mailto:sigvard.akerman@od.mah.se)

#### Timing in the curriculum

String throughout the programme

#### Primary Aims

To introduce students to the basic principles of ethics; and to ensure that they have competence in the professional regulations and the legal framework within which oral health care operates in Sweden and EU

To stimulate students to think critically and judge on ethical issues .

#### Main Objectives

The graduates should:

- be able to analyse individual cases considering ethical and professional rules and legal constraints.
- deal professionally in the clinical settings in terms of the ethical/legal framework as it applies to consent to treatment, confidentiality, record-keeping and avoidance of negligence
- understand ethical issues of decision making and the relation between cause and effect
- be able to discern critical aspects of professional situations and observe social and ethical responsibility in professional practice
- strive to assume personal responsibility for judgements, decisions and actions
- pursue continuing professional development
- be able to understand environmental issues of the profession

## **16.4 Practice Management**

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### **Timing in the curriculum**

This area is an integrated component of comprehensive oral health care. Situations which elucidate practice management and team work are presented to the study-groups, as an integral component of learning especially during the fourth and fifth years. Learning is paralleled with experiences in the clinical settings by direct contact between students, their clinical instructors, dental nurses and dental technicians, thus ensuring that the planning is formulated and the implementation of patient care is carried out in a manner compatible with a professional context. Furthermore, the students' learning experiences are reinforced in the Public Dental Health Service during the fifth year. 'Business Management' skills necessary to run a private dental practice are not included. These are recognised as more appropriate to be undertaken in a postgraduate environment.

### **Primary Aims**

The primary aims are that the graduates should be able to apply their knowledge on legal, financial and organisational requirements in providing oral health care for the individual patient as a member of a community/society at large and to act as a member and a leader in an oral health team.

### **Main Objectives**

The students should have an appropriate understanding and skills:

- that in order for treatment to be successful it must be compatible with the needs of patients
- that the provision of oral health care has a time and cost value associated with it in particular in consideration to the patient
- of team work with other health workers particularly within the oral health team

## 16.5 Behavioural Science

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Primary Aims: The education in behavioural science should

1. support the student's personal development to become a professional therapist (vårdgivare).
2. develop the student's communication skills (samtalsmetodik).
3. develop the student's understanding and knowledge of theories of human personality development (personlighetspsykologi).
4. develop the student's ability to implement knowledge and understanding from step 1-3 in a pedagogical way in a clinical setting for the benefit of the patient (professionellt förhållningssätt).

Educational Approaches:

1. In keeping with the educational approach used in Malmö, student learning is based on the principles of problem-based learning, which in itself presents training in communication and awareness of the importance of psycho-socio-cultural factors. Clinical problems presented to the students in the clinical setting and in the study groups need explanations in terms of underlying psychological, social and cultural processes and mechanisms. Applied knowledge in social and behavioural sciences is used to explain clinical findings and phenomena and to underpin decisions on diagnosis, treatment and prognosis of oral diseases.  
Throughout the entire educational process, the student's personal development towards a professional therapeutic attitude is supported. This implies supporting an understanding based on empathic capability, on a willingness on behalf of the student to introspection or quality-assessment of their own behaviour, and a willingness to engage in group activities for sharing and supporting the personal development of fellow students.
2. The student practises communication skills throughout his clinical training. Opportunities should be provided for him to reflect on his own behaviour and that of his fellow students, and also to draw on the experience of others in a learning situation. For this to occur, he needs the expertise of experienced clinicians as facilitators. The psychotherapeutic rapport situation should be regarded as a golden standard to which the communication skills could be evaluated.
3. The student needs to have an understanding on how different theoretical schools of psychology look upon the formation of a personality. This will give him an appreciation of the relativity of a humanistic approach to therapeutic work. Furthermore, the student will need to base this theoretical knowledge in practical encounters, varying from enhanced self-knowledge to application in group processes and behaviour of patients.
4. The topics from step 1-3 will form the basis for the implementation in the clinical setting, the therapeutic situation, of an effective pedagogical handling of information pertaining to the patient, the therapist and the demands of the society. The knowledge and understanding of personality development, of communication skills and the student's personal development as therapist, will thus eventually result in a capability to establish a rapport situation with the patient, holding high ethical standards, and supporting the patients in the direction of a better quality of life.

### Timing in the curriculum:

Step 1 should be part of the curriculum from the first day the student starts up the dental education. The initiation of a process of personal development and willingness to engage in self quality assessment is the prerequisite for a successful outcome in the clinical training to become good clinicians. Training in step 2, communication skills, should commence in the early part of the dental training in order for the student to become an efficient communicator in the clinical setting with real patients. In the second half of the educational programme the student is introduced to step 3, the world of psychological theories of personality development. This requires both a clinical experience on behalf of the student to appreciate theoretical frameworks for their clinical encounters, and also a maturity to tolerate the relativity of psychological theories. Step 1-3 will give the student a knowledge and attitude basis from which he will draw upon when implementing in step 4 his therapeutic skills for the benefit of the patient. The student is encouraged to articulate his personal touch to a professional attitude, within acceptable legislative levels of clinical dental expertise. Step 4 will need to be initiated in the second half of the educational programme, and should be a central theme of behavioural science during the last semesters.



## • STUDENT ELECTIVE RESEARCH PROJECTS

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### 1. Background and timing in the curriculum

The students conduct minor research projects under supervision during 3rd, 5th and 9/10th semesters.

### 2. Primary aims

The graduates should:

- become absorbed in a subject area that has aroused their interest
- develop an ability for independent search for knowledge
- assess new knowledge critically
- collect facts
- make use of new knowledge in problem-solving and innovative work
- acquire practical skills in scientific methodology
- develop the ability to present scientific investigations orally and in writing
- improve upon linguistic proficiency so as to achieve better communication with patients, colleagues, administrators, politicians and the media

### 3. Main objectives

The graduates should

- be able to define and describe a scientific problem
- be able to search for, read and critically summarise scientific information
- understand basic principles of research design
- understand descriptive statistical methods and their application
- understand metric theories, biometrics and psychometrics in general
- understand epidemiologic methods in general
- understand the rationale of decision making with scientific evidence
- be able to use common techniques in presentation of a scientific project orally and in writing
- be able to present a scientific article in writing to a non-professional public

### 4. Hours in curriculum

The total time in the programme for Student research projects corresponds to 12 credits (12 study weeks or 6% of the curriculum).

### 5. Method of learning/teaching

In line with the principles of self directed learning

- students choose subject area and problem freely by themselves and contact a supervisor
- projects are performed individually or in groups of preferably two students

- a written report shall be presented and defended in a public seminar with another student group as opponents. Both presentation and opposition will be evaluated as well as the written report.
- the same subject/project may be run over all periods but a separate report has to be presented for the work in each semester
- the projects are to be done within the dental faculty or in other affiliated national/international institutions e.g. dentistry, medicine, social sciences, humanistic sciences. A member of the dental faculty will be the responsible supervisor

## **6. Assessment Methods**

The project and the report is assessed by the supervisor. In the final seminar feed back is given of the oral presentation and opposition by other supervisors.

## **7. Strength**

The projects are introduced early in the programme to stimulate the interest in self directed learning. A student can continue with one project throughout the whole programme. Some projects (3) have been of high quality, published in international journals. Formal training in written communication is given by an external expert.

## **8. Weakness**

Time and other resources are scarce to allow proper training and feedback in communication. Students in need of training in written communication tend to ignore the learning opportunities. Both students and supervisors tend to spend too much time and effort in the projects.

## **9. Innovations/Best practices**

Instructions to reduce ambitions in the first project (3rd semester) restricting it to a critical literature survey.

## **10. Plans for future changes**

Considering ways of strengthening training and feed back of written and oral presentation

## **11. Visitors Comments to: STUDENT RESEARCH PROJECTS**

Students carry out a research project as part of their training, working individually or in pairs. The choice of the subject area is determined by the students. In the 3rd semester three weeks full time is devoted to the project. The emphasis is on critical reviews of the literature. In the 5th semester another three weeks are allocated to planning the earlier or a new project. Finally in the 9/10th semester five weeks are devoted to the written report and public presentation of the earlier or a new project.

The projects appear to be of strong interest to the students and a small proportion have published the research. Each project is allocated to a small number of students (2) resulting in a large number of projects at any one time. Staff and students therefore devote a large amount of time to the area. It may be more practical to allocate a project to a larger group of students (8).

## Section 17: Examination, Assessments and Competences

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### 1. Describe as briefly as possible the overall approach to assessments in the school and explain where they are summative or formative

- Formative assessment:

There is a balance between formative and summative assessments over the programme with formative assessment being an integral and on-going activity of all courses. Self-assessment and peer-assessment, in particular, is a key element employed throughout the curriculum to empower the students. This has been shown to increase the motivation to learn and change student attitude from one of “how have I performed” to that of “how can I get better?”. The implementation of self-assessment in the clinical setting is elucidated in the article Ericson D, Christersson C, Manogue M, Rohlin M. Clinical guidelines and self-assessment in dental education. Eur J Dent Educ 1997; 1:123-8. (Enclosure 5)

- Summative assessment:

Each course (20-week-semester) finishes with a 1-week summative assessment period. The assessment is criterion-referenced i.e. the assessment is to discriminate between those who can show evidence of having achieved the intended learning outcomes in the course and those who cannot. Thus, students are assessed on a pass-fail basis and the student performance is not distributed across a range. Different subject areas such as physiology, microbiology, cariology, and periodontology are integrated in the assessments. A summative assessment often includes different parts: a written examination in the form of modified essay questions, another part intended to give a view of the student’s ability to elaborate on data and draw conclusions from collected material, and a more clinically-oriented examination. Summative clinical examinations are performed at the end of the 3<sup>rd</sup>, 6<sup>th</sup> and 9<sup>th</sup> course. Each summative assessment includes a mandatory student evaluation of the actual course.

Summative assessment periods are as follows:

Course	First period	Second period	Third period
1,3,5 7,9	January	At least ten weeks later	August
2,4,6,8	June	August	At least ten weeks later
10	April-May	June	August

- Assessment groups:

For each course, the Committee for Undergraduate Education appoints a faculty member to act as the assessment co-ordinator and director and 3-4 additional staffs representing different subject areas to make up an assessment group. The assessment co-ordinator could be considered to be an external in the sense that s/he is not involved in the actual course. The group is responsible for the planning and the execution of the summative course assessment. An educational consultant works with all assessment groups for two days each semester to assist them to improve on the assessments according to evidence from educational literature.

- Marks are Pass/Fail:

To pass a course, the student shall participate actively in obligatory parts and the assessments. Obligatory parts comprise study-groups, training in skills laboratories, experimental laborations, seminars and demonstrations in the clinical settings, and patient care. The student has to receive pass grade in the study-group and in the clinical settings to be allowed to participate in the final summative assessment.

- Re-assessment opportunities:

A student has 3 opportunities to pass the summative assessment of each course. After a second failure the student receives counselling together with the assessment co-ordinator, the Associate Dean of Undergraduate Dental Education and the student councillor. Following three failures of the same course, a student may, upon the presentation of special reasons, have the option to repeat the whole course, and thus be accorded three new assessment opportunities.

- Objectives of course plans to be assessed and assessment formats:

Since knowledge, skills and attitudes are inter-related, no assessment method can measure a single skill or competence. Therefore, different assessment methods are applied as described above.

#### *Knowledge, its understanding and application*

Knowledge acquisition is assessed by different methods with a reasonable balance of different formats and in different settings. In the study-group formative assessment takes place continuously. In the summative assessment, short essay questions, open essays and oral examinations are combined. Efforts have been made to formulate a framework for assessment that is consistent with qualitative aspects of learning i.e we try to focus on the students understanding of critical aspects of phenomena they are dealing with, instead of only passing judgements about what they got right and what they got wrong. The trigger for questions is often case presentations, also early in the programme, to reflect autentic situations and kinds of processes seen central to the profession. Formulating and solving a problem in a previously unseen context and the definition of individual learning goals are other assessment issues.

#### *Skills*

Generic skills are assessed directly and indirectly in a range of ways. Oral communication skills are tested in the day to day work in the clinical settings, in the study-groups, in the seminars and the oral examinations. Presentation skills are developed and assessed in the study-groups, seminars and in oral presentations of the student research projects. Written communication skills are assessed by the essays and the research projects. The projects must be presented as word-processed to elucidate the students' IT-skills.

Self-directed learning and self-assessment skills are assessed throughout the programme both in the examinations, in clinical settings, in the skills laboratory and in the study-groups. Self-assessment skills are focused on in a special formative assessment each course and in summative clinical assessment course 9.

Clinical skills are assessed in the clinic settings. Also when assessing technical aspects, it is aimed that the assessments address underlying meaning. There are clinical recordings and reviewing procedures in which students assess their own clinical skills with subsequent staff validation takes place. In the skills laboratory, peer assessment intervenes the self-assessment and staff assessment. In order to enable the students to do self- and peer-assessment there are defined criteria to a range of competencies which staff-members have defined in beforehand. These criteria are available to the students for routine interventions. In the skills laboratory, the task to define criteria for different procedues comprises one part of the assessment.

Summative assessments are performed when the students finish course 3, 6 and 9. Different competences are assessed in OSCE-type systems. The assessment for course 9 comprises of the first meeting with an unknown patient to completely mimic the reality. The students different abilities are judged with the aid of a VAS.

### *Attitudes*

The recording and reviewing process with a responsible group instructor per semester offers a unique opportunity to assess an individual student's professional attitudes. With continous self-assessment an attitude of critical self-awareness in realtion to studnets current level of knowledge and skills is promoted. The daily work with patients on the clinic and with peers in the study group enables students' attitudes to be monitored informally, To further enhance these actions a discussion with the student, the clinical instructor and the facilitator is performed according to the guidelines enclosed (Enclosure 6).

## **2. How much does the school rely on exams to motivate students**

All assessments, formative and summative, have the purpose to play an important role in the students' learning i.e. to focus and enhance student learning while learning is taking place. The formative assessment is in particluar important to empower the students as it takes place in as least threatening a manner. After the analysis of written summative assessments there are follow-up seminars where the resource persons discuss the possible solutions and answers with the students to enhance learning.

## **3. Strenghts**

- Focus on understanding and competence
- About 80% off the formative and summative assessments match the course objectives
- System with examination-groups, independant co-ordinators similar to external examiners.
- The Committee of Undergraduate Education appoints an assessment group, consisting of different subject areas.
- Different assessment formats to reflect the inter-related nature of competence.
- Emphasis on self- and peer assessment
- Faculty competence development and quality development of the assessment system with evidence-based approach together with an educational expert
- External examiners from real life context

#### **4. Weaknesses**

Although the system has been evolving now for 9 years we still find it difficult to design high-quality assessments and criteria in harmony with the intended learning outcomes for all courses. There are parts of two out of eleven courses which do not match closely the assessment procedures and learning objectives. Although the students have identified these assessments we have had difficulties to accomplish true changes of these examination and it produces a “hidden” curriculum.

When students begin their first-year-studies, they are used to norm-referenced assessments which aims to discriminate between students so that those who do better on the assessment task receive higher grades than those who do less well. This presupposes however one best answers whereas the questions in our examinations may have more than one possible answer. Moreover the students are used to questions on a short text, as compared with the assessment of the learning outcomes of a 20-week-course. This creates in particular in the early phase of the curriculum a feeling of anxiety among students.

Although there is only one summative assessment period per course we spend too much time on the planning of the assessments and on the analysis of the answers. There is room for a more optimal handling of the assessment system.

#### **5. Innovations and/or Best Practices**

- The encouragement and training of self-assessment. Self- and peer-assessment as a key concept to empower students and to stimulate students to use their own judgement
- Criterion-referenced assessments with defined criteria, particularly in the clinical settings
- The Committee of undergraduate education's appointment of an assessment groups. The fact that the group consists of staff-members of different disciplines and an “external” assessment co-ordinator secures an integrated approach.
- The use of assessments to understand students knowledge and its application of important concepts
- External Examiners from the professional body (Chiefs from the Public Dental Health Service)
- Continuous faculty development in the design and analysis of assessment systems with all assessment groups present.
- Use of multi-formats to assess different aspects of competence
- Follow-up seminars of summative written exams
- Students comments on the assessment procedures have to be taken into account
- Structured feed-back system with so called “development talks”

#### **6. Plans for Future Changes**

The Committee of Undergraduate Education is presently working with a new system for the assessment groups with one co-ordinator for three courses to create an even better continuity. There is a continuous improvement on the assessment system with Mr Dick Mårtensson (educationalist at the Karolinska Institutet) as a consultant. The summative assessments with too specific facts and procedures have to be improved. For the assessment of knowledge and understanding a progress test with multiple choice questions, similar to the one implemented in Maastricht, is planned. The summative assessments are planned to be more limited and the formative assessments to increase. Also the introduction of more short report writing to

promote and assess written communication skills is discussed. We aim to involve the supervisors in the Public Dental Health Service more in the assessment of the students' competences when the students work with the same professionals in a real life setting.

### **7. Explain as to what level external examiners are involved**

As explained above the individual who is co-ordinator of the summative course assessment is not involved in the actual course.

Colleagues from the Dental School of Oslo University, Norway have evaluated our assessment system and co-operated in the summative assessments. Furthermore, during the clinical examination of 9<sup>th</sup> semester, external examiners from the Public Health Service assess the students in parallel with so called "external" examiners from our own faculty.

### **8. What formal completion of an exam is required of the school/university for students to qualify and register as dentists**

The Faculty of Odontology of Malmö University is the degree awarding authority presenting the graduate with the University Degree in Dental Surgery. The National Board for Health and Welfare is the licensing authority.

### **9. The extent to which the school seeks those competences recommended by the EU Advisory Committee on the Training of Dental Practitioners**

We try to take those competences into account. The faculty wants to discuss the competences recommended by the EU Advisory Committee on the Training of Dental Practitioners with the Site Visit Group.

## **Section 10 Visitors Comments to Section 17: Examinations/Assessments and Competences**

The school has spent a large amount of time and effort developing the examinations, assessments and competences for the curriculum. The balance between formative and summative assessment is good. Self assessment is a key component of the formative process and students and staff collaborate well in this area. The summative assessment is linked to each course with a written part, an assessment of students ability and a clinically orientated examination. The main clinical assessments take place at the end of the 3<sup>rd</sup>, 6<sup>th</sup> and 9<sup>th</sup> course. A pass/fail system operates, which could be regarded as restrictive in that students are not rewarded for exceptional performance. However, the pass mark is 75% and students are happy with the system.

Most of the assessments match the course objectives and the use of external examiners from the public service gives an independent view. Like most PBL type programmes considerable time is spent in the assessment process.

## **Section 18: Other Influences**

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

See description below 1.1. Background in Section: INTRODUCTION and GENERAL DESCRIPTION (page 6).

### **18.2 Evidence based treatment**

Professor Madeleine Rohlin

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In the study group, in the clinical settings and in skills laboratory discussions are based on scientific evidence. Students are expected to read articles recommended in the literature list, where most of the references comprise contemporary articles. The meaning making in the study group should focus on the group members' different interpretation of the articles. The scientific approach is further enhanced during the seminars when the resource persons elucidate the students' questions from perspectives of the most contemporary science. In the clinical settings the application of diagnostic modalities, treatment planning and interventions should be based on evidence. Decision making and decision analysis, similar to evidence based oral health care, are learnt by the aid of problems.

### **18.3 Involvement in other university activities and sport**

*Mikael Carlsson (dental student), Fredrik Sjöblom (dental student)*

The student union hires a sports hall for sport activities 2 days a week 1 hour each. In 1999 students have also joined an inter-company football league and represent the faculty by one team. Every year there is golf competition students vs. the faculty. The student union committee for festivity collaborate with the faculty and their employees for various entertainment and party arrangements.

### **18.4 Recreation**

*Mikael Carlsson and Fredrik Sjöblom (dental students)*

During each semester there are several opportunities for recreation and a social life. There is always a greeting party and a "kick off" dinner for new students. Several dinner parties with different themes are also traditions. The student union committee for cultural arrangements often get tickets for operas and theaters to a subsidized price. The committee also arrange testing of various stronger drinks, sometimes with a representative from the State liquor shop with specific knowledge. Students in first and last course are traditionally asked to set up a students farce open for teachers and other personnel at the faculty.

### **18.5 Student selection procedures**

Mr Anders Stenlås

e-mail: anders.stenlaas@od.mah.se



Students apply through a central office for all Swedish Universities (the National Admission Office to Higher Education, VHS) and are selected on their grades achieved in the third level education (upper-secondary school). Only students, who fulfil the requirement of studies in nature sciences with specified course levels are accepted.

### **18.6 Labour Market Perspectives**

*Mr Anders Stenlås*                      *e-mail: anders.stenlaas@od.mah.se*

During the period 1985-1998 the main picture was a decline in the labour market, which resulted in a cut down of the available training of dentists with 50% as compared to the mid 80-ties. A picture of a poor labour market was mirrored in media and affected student counsellors. A recently published investigation, made by the Swedish Dentist's Union in March 1998, shows that 1995-1997, 920 dentists were licenced and 665 of them were living in Sweden. 255 dentists had returned back to their home countries (mainly in Scandinavia) or emmigrated preferably to UK. Among those who stayed in Sweden, 84% were employed. During 1998 the authorities as well as media have presneted a quite different and promising market. In 2005-2010 about 50% of the practising dentists in Sweden will retire and there will be a troublesome shortage of dentists, a vision that hopefully will make the profession and dental studies more popular among students in being.

### **18.7 Student involvement in the faculty**

*Mikael Carlsson (dental student), Fredrik Sjöblom (dental student)*

Students are involved in the faculty by the student union. The student union comprises an union board and 5 committees (Sports, Educational, International, Cultural and Festivity). In the faculty board there are two seats for student representatives, and in the faculty committee for undergraduate education there are three seats for student representatives. Students are also represented in several other committees and boards. When there is a temporary committee or workgroup set up, the student union is usually asked to send representatives.

### **18.8 Visitors Comments to Other Influences**

- PBL system is based to a large extent on information obtained from scientific articles by instructors and students and this broadens their experience.
- The faculty will soon have accommodation for students and staff to be used for recreation purposes.
- The students have a sports committee, a choir, an orchestra and a dancing group. Students themselves encourage this activity, but time for recreational activities and travel is limited.
- Learning in groups promotes the idea of sharing other interests and activities.
- There are plans for a research project studying the influence of new selection procedures that includes interviews and testing of manual skills on the students performance during the courses.
- The labour market prospects are improving. There will be an increased demand for dentists in the future, because of the number of dentists due to retire in the coming years.
- The school should reflect this predicted manpower situation and not decrease the number of students in training.

- The contributions of the student representatives on the Faculty Board and other committees are greatly appreciated by the school.

## **SECTION 19: Student Affairs**

Mikael Carlsson (dental student), Fredrik Sjöblom (dental student)

Professor Madeleine Rohlin e-mail: madeleine.rohlin@od.mah.se

Mr Anders Stenlås e-mail: anders.stenlaas@od.mah.se

Name of Student representatives who will discuss :

Final year:

Fourth Year: Mikael Carlsson, Thomas Aldredsson, Tony Yakob

Third year: Laya Abou Absi, Pernilla Holmberg, Helena Hurtig

Second year: Anna Bogdanovic, Helena Christell, Niklas Nordahl

### **19.1 Basic Data from Dental Sools**

- Average number of dental students qualifying per year: 33
- Average number of dental students admitted to the first year: 40
- Length of course in years and/ or semesters: 5 years/ 10 semesters
- Is there a separate period of vocational training following graduation as a dentist in your country: **NO**

### **19.2 Description of Postgraduate Education**

See below in Section 20 considering research education and training.

Together with County Skåne and the Public Dental Health Service, the faculty presents specialist education and training in all 8 certified specialities (Endodontics, Oral Radiology, Oral Surgery, Orthodontics, Pediatric Dentistry, Periodontology, Prosthodontics, Stomatognathic Physiology). Recently, a new programme was implemented, which will be presented to the visitors. The programme is a 3-year modular clinical programme and it includes a research project equal to two publications.

### **19.3 List different auxiliary/ technology/other courses and state number who qualify per year:**

- Dental technicians 3 years 16 students per year
- Dental hygienists 2 years 16 students every second year

(This programme is re-evaluated and a new programme will be suggested this year)

### **19.4 Student Counselling**

The central administration at Malmö University provides the students with general counselling services, as well as social and psychological advice. Four hours per week a special office at the Dental School will be open to the students.

The students office in the faculty administration provides the students with all formal information and advice about the studies within the faculty

The PBL system offers frequently opportunities for student counselling by facilitators, by clinical supervisors and by other staff members.

### **Section 19.5.**

#### **Visitors comments**

With regard to clinical specialities in Postgraduate Education, the school co-operates with the Public Dental Health Service in a way that they are responsible for the theoretical teaching aspect, while the Public Health Service is responsible for the clinical training.

- The possibility to achieve specialisation ( e.g. Endodontics, Oral Radiology, Oral Surgery, Orthodontics, Paediatric Dentistry, Periodontology, Prosthodontic Surgery, Stomatognathic Physiology ) is available. It is suggested that, in addition, some form of continuous education for dental practitioners should be encouraged.

## **Section 20: Research and post graduate research training**

Professor Lars Matsson  
Professor Krister Nilner

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e-mail: krister.nilner@od.mah.se

### ***Faculty research***

More than half of the approximately 85 teachers at the faculty (part-time employee included) have a degree of Master of Odontology (Odont. Lic.) or a doctor's degree (Odont. Dr.). All Professors and Associate Professors have a degree of Odont Dr. Positions as teacher include specific time intended for own research (Professors 50%, Ass Professors 33%, Clinical instructors 20%). In addition, at the faculty there are 5 post-doc positions (forskarassistent) for full-time research. Each year the faculty members publish 80-90 scientific papers or textbook chapters (Enclosure X). The vast majority of these are published in English in international scientific journals.

### ***Research training***

The post graduate program for research training comprises 4 years for the degree Odont Dr and 2 years for the degree Master of Odontology. For the doctoral degree, the curriculum includes ½ to 1 year of scientific courses; the rest of the 4 years is designated for the research project. A thesis usually consists of 5-6 scientific papers and a summary and is published in the form of a booklet. The thesis for a masters degree usually consists of 2-3 papers and a summary.

About 40 students are registered in the programme. More than half of them are part-time students and some are employed by the Public Dental Service and carry out their research outside the School of Dentistry. The faculty has 16 positions for full time research training. Each year 4-6 students graduate with a degree of Odont Dr and approximately 1 student with a Master of Odontology (Odont. Lic).

### ***Career structure***

Of the 72 dentists who have graduated with a doctor's degree the last 15 years, about 1/3 have a position at a Swedish dental school and almost 1/3 are working in the Public Dental Service. The remaining dentists are for example working at a dental school abroad, in the industry or at a school of medicine.

**20.1-3 Number of publications in journals and number of textbooks, textbook chapters and theses 1996-1998 (36 months) published by staff**

Abstracts of publications covering the three years are presented in the booklet “Annual Publications” which will be presented to you at the Site Visit. Reprints of papers published in 1998 will be presented in a special hard back during the Site Visit.

	Publications in refereed journals	Publications in other journals	Textbooks	Textbook chapters	Theses
1996	59	3		6	8
1997	65	3	2	5	4
1998	59	4		1	6
Total	183	10	2	12	18

## 20.4 Grants received 1998 (12 months) > 8 000 Sw kr

<b>Foundation, etc</b>	<b>Amount received</b>
Total	1 406 000 Sw Kr
WHO	200 000
Swedish Patent Revenue Research Fund	120 000
Industry	278 000
Swedish Dental Society	27 000
Swedish Dental Society	13 000
Swedish Dental Society	12 000
Swedish Medical Research Council (MFR)	100 000
The Patent Fund	25 000
Crafoord Foundation	80 000
MFR	73 800
MFR	19 000
Royal Physiographic Society	25 000
Swedish Dental Society	9 000
Swedish Dental Society	14 000
Swedish Dental Society	12 000
Swedish Dental Society	12 000
Industry	106 000
MFR	116 000
Industry	149 000
Swedish Dental Society	15 000

## 20.5 Invited presentations 1998 (12 months)

Staff members have been represented as invited speakers at conferences or at universities in the following cities.

Brussels, Belgium (2 speakers)	Dokkyo University, Japan	London, UK
Bauro, Brazil	Matsumoto University, Japan	Leeds, UK
Aarhus, Denmark	Nigata, Japan	Lake Arrowhead, California, USA
Copenhagen, Denmark (2 speakers)	Tokyo, Japan (2 speakers)	Los Angeles, USA
Helsinki, Finland	Yokohama, Japan	Hanoi, Vietnam
Nice, France (4 speakers)	Oslo, Norway (4 speakers)	Ho Chi Minh City, Vietnam
Berlin, Germany	Warshaw, Poland	Several meetings in other disciplines in Swedish universities
Hamburg, Germany	Barcelona, Spain	
Munich, Germany (3 speakers)	Oviedo, Spain	
Reykjavik, Iceland	Bern, Switzerland	
Dublin, Ireland (4 speakers)	Munchenwiler, Switzerland	

## 20.6 Visitors Comments to Research and Postgraduate research training

The staff, both full time and part time, have in general a strong research background and training. All Professors/Assistant Professors have a doctorate degree. Specific time is set aside for research for staff and this varies according to rank, i.e. 20% to 50%. Research output is strong with up to 65 papers in refereed journals each year. In addition there are publications in textbooks and theses. Income from research was 1.4 million SEK in 1998 and the sources ranged across WHO, government agencies and industry. The school also provides some limited funds for research but this is not necessarily related to degree of activity.

The major departments in the school have their own research facilities, and in the areas that have been renovated, these are excellent. There is also a central research facility including an outstanding animal unit, and staffs have the opportunity to use the University facilities. Emphasis is given to clinical research as opposed to basic science in Malmö. There are plans to develop the field of oral biology, which should increase research in this area.

A recent report commissioned by the Swedish Research Council recommended that there should be a focus on areas that have a strong basis in Universities. The age profile of senior staff is high and 6 senior staff will retire soon. It is important they are replaced with staff with a strong research focus. In addition the recruitment of postdoctoral students would help in stimulating research.



**E-mail addresses of professors/chairmen/-women**

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## SECTION 21: QUALITY DEVELOPMENT

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### Introduction

Since 1990 when the new curriculum was implemented there has been a QUALITY MANAGEMENT AND ENHANCEMENT PROGRAMME, which was formally approved by the Faculty Board 1996. The programme was based on Lund University's programme "Enhanced Undergraduate Education". One part of the programme comprises the "Self-assessment of undergraduate education" published in February 1997, which was a part of the Assessment of Lund University in June 1997 performed by the Swedish Council for Higher Education. The responsibility for the quality management and enhancement is with the Faculty Board and its committees as follows:

- Committee for Undergraduate Education      undergraduate education of dentists and dental technicians
- Committee for Continuing Education          specialist education, continuing education and faculty and staff development
- Committee for Research Education          research education and research
- Committee for Oral Health Care              care at the student- and teacher clinics.

The quality management and enhancement is maintained continuously and it consists of several components. Below we exemplify some of them which can be worth while to promote in undergraduate education.

### 21.1 Faculty and Staff Development

The main ideas of our faculty and staff development are presented in Rohlin M, Falk-Nilsson E. Faculty and Staff Development. Proceedings, 20<sup>th</sup> Annual Meeting for ADEE , 1994:49-56 (Enclosure y1).

The overall Aim is to create a Learning Organisation. Some of the detailed aims are:

- to provide an "educational language" and establish a conceptual framework for learning teams, where all faculty and staff members are involved
- to clarify and enhance our understanding and attitudes on how we interact and learn
- to provide and strengthen specific skills such as being a facilitator or examiner
- to give support for the creation of innovative learning situations in empowering environments
- to develop self-perception among the staff as professional academic educators

### Implementation

The model for faculty and staff development comprises three domains namely: general insights, broadening and deepening of knowledge in oral health sciences and educational competence. Each domain is inclusive, *i.e.* insights in cognitive psychology on learning will

stimulate the need for increased knowledge in oral health disciplines and general subjects and vice versa. For the implementation there are different stages, which enable gradual acquisition of the competence. All staff members, dentists, dental assistants, secretaries and staff working in the laboratories are involved. The major part of courses takes place within our own facilities with one faculty staff member and one external consultant being the resource persons.

### Evaluation

A major change of the programme places high demands on faculty and staff development. There has been and is a priority among the leadership to provide rich opportunities for development. There is a great interest in further educational training among the staff. However, conceptual skills which are most necessary in a Learning Organisation are difficult. They could be learned but not taught. The development of efficient facilitators for the clinical settings seems to be one of the most difficult parts of faculty and staff development to deal with.

## **21.2 Student Evaluation**

### PROGRAMME EVALUATIONS

Two programme evaluations have been carried out. One was initiated by Lund university Evaluation Centre, *The Student Barometer (1996)*. It consisted of a questionnaire with factual questions, questions where students from Lund university were asked to rate the importance of the actual question and the extent to which they were satisfied with the current conditions. The other evaluation was carried out by the Swedish Central Office for Statistics. All graduates of Swedish universities of different disciplines are asked when they have been professionals for 2 years to rate the importance and the educational quality of oral and written communication, rhetoric and team work.

### COURSE EVALUATIONS

Since the new curriculum was implemented there have been systemic course evaluations. Student's course evaluation is a mandatory part of the assessment and is performed on the 3<sup>rd</sup> or 4<sup>th</sup> day of the assessment week. There is one oral structured evaluation in the study-group together with the assessment co-ordinator (a staff-member not involved in that particular course). Individual written evaluations are also provided. The written evaluations comprise several open-ended questions and free space for individual opinions. The questions are focused on educational methods, objectives, content, structure, time-sequence of the particular course and on the student's opinion on his/her progress.

The main aim of the course evaluation is to improve on the quality of the course and the programme. Another aim is to stress students' responsibility for improvement of their educational environment and to promote their ability to express their viewpoints orally and by writing in a well-motivated way. Their viewpoints are summarised by a staff-member in the administration.

The assessment co-ordinator presents the written view-points and suggestions presented orally to the course co-ordinator and course group who elaborate on the students' as well as the staff's viewpoints after each semester. The course is changed according to a consensus decision of the involved staff.

### 21.3 Faculty and Staff Evaluation

During 1998, Lund University conducted a staff satisfaction survey “*The Teacher Satisfaction Survey*” (*Lärarbarometern* in Swedish). All teaching and research staff was asked to share their experiences about their workplace and learning environment. From the particular part of the Summary of the survey describing our staff’s response it can be read: ”At the Faculty of Dentistry (the Oral Health Centre), the total educational programme is based on a comprehensive pedagogical idea, which has led to unity around common goals, systematic development efforts, and co-operation between different departments. More often than in other faculties, teachers express their satisfaction with various aspects of the education and their work situation. Only one of the questions caused any response of dissatisfaction“.

### 21.4 Self Assessment of Undergraduate Education

Since the implementation of the PBL curriculum two self assessments were performed, one in 1996-97 and the present one in 1999. The Faculty Board appointed a group (evaluation group) consisting of five staff members representing different subject areas, two students, one expert in the field from the employment area and one educationalist to be responsible for the self-assessment. The first self- assessment were based on a SWOT (Strength – Weaknesses- Opportunities-Threats) analysis, where hearings with student courses and course co-ordinators and assessment co-ordinators played a significant role. The present self-assessment followed a similar scheme with hearings with student courses and meetings with the departmental heads, course- and assessment co-ordinators, where the self-assessment report and programme was discussed. At one of the meetings an external educational consultant led the discussion.

### 21.5 Internationalisation

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- **Background**

The Swedish Ministry of Education and Science initiated in the 1970-ies a programme for internationalisation of higher education, especially undergraduate education, in Sweden. In the faculty of odontology international co-operation and contacts in research has got a long-lasting and firm tradition and the faculty is appointed WHO Collaborating Centre. As Swedish is a small and peripheral language world wide, teachers are used to practice English also in educational settings.

- **Undergraduate programme**

The PBL approach supports in the undergraduate education internationalisation in several ways. As can be seen from the enclosed literature lists of courses 2, 5 and 9, a substantial part of the recommended literature is international. Thus, it is an aim of the programme to stimulate the students to be able to follow literature written in English and be part of the international scientific community and use evidence in clinical problem solving. IT and Internet are forceful and frequently used tools for this purpose. These efforts are strongly supported by two particular projects:

- the development and use of a WHO data base (dept. of Cariology) covering information about oral health and resources for dental care world wide

- the development of multimedia-based education (dept. of Periodontology) to be used world wide on Internet.

- **Student and staff exchange**

Staff exchange in research occur frequently. Staff and student exchange in undergraduate education is emerging, mainly within EU. Institutional contracts are established with Leeds University, UK, University of Cardiff, Wales, UK, University of Gent, Belgium, and Université Paris 5, France, as well as the Scandinavian universities. Students and supervisors are encouraged to run student research projects in co-operation with faculties abroad.

- **International labour market**

The above mentioned efforts are well motivated related to the labour market for dentists. Approximately 30%, graduated 1995-99 have emigrated. The immigration statistics of Sweden shows that 33% of the residents in the city of Malmö are immigrants, and they comprise a noticeable group of patients in the dental school. In the undergraduate dental programme the proportion of student with immigrant background is as high, 30-40% during the 90-ties.

- **Entrance and permanent transfer of students to Malmö from abroad**

The main responsibility for discussions regarding acceptance and course placement rest with the Committee of Undergraduate Studies. The applicant must meet the general requirements for university studies in Sweden as well as the specific requirements for dental studies. As a minimum requirement for transfer the applicant must have taken and passed courses equivalent to those given in the programme in Malmö during the two first semesters. Applicants, who do not have Swedish as their mother tongue, must have the knowledge and fluency necessary to follow the programme, and be ready to prove their ability to master Swedish.

## **21.6 Visitors Comments to Quality Development**

There is an in-house Quality Management Programme, which was formally approved by the Faculty Board in 1996. Quality development is mainly achieved by the following inputs:

1. The students are regularly involved in the evaluation of the courses. Such evaluations form part of the assessment period at the end of each course and makes an important input to the improvement of the quality of the program.
2. There is a continuous evaluation of the quality of the curriculum in the study groups and seminars.
3. External examiners from the Public Health system are involved in some clinical assessments and contribute to quality enhancement.
4. An important aspect of quality assurance is implementation of a policy for faculty and staff development in which all staff are involved. The School puts great emphasis on quality development and staff and students are continually assessing the program.

## **SECTION 22: OVERALL COMMENTS ON THE SCHOOL**

### **SUMMARY REPORT**

#### **1. AIMS AND OBJECTIVES**

**Aims and objectives are primarily focused on the following principles:**

- oral health**
- holistic view**
- teamwork**
- self-directed learning**

**These principles are more and more accepted in dental education all over the world as an answer to the question on how to train dentists for the future. The Malmo dental school, however, has taken a world-wide lead in establishing this concept.**

#### **2. PROGRAMME CHARACTERISTICS**

**The school is a key component of the new university in Malmö and is recognised as one of the leading dental schools in education and innovation in Europe.**

**The clinical learning experience is introduced in the first year. An introductory course takes place during the first semester. This is followed by a series of 9 courses covering the prevention, diagnosis and treatment of oral diseases. The relevant basic, medical and clinical sciences are integrated into the courses in a longitudinal fashion and with relevance to the individual clinical programme. The planning of the courses is a collaborative effort between dental clinicians, medical experts and basic science staff. These experts also act as resource-persons, for instance in seminars.**

**Key-elements of the programme include seminars, study groups and lectures as requested by student groups.**

**The whole of the programme is overseen by the Undergraduate Education Committee, which reports to the Faculty Board and draws on the resources of the 15 departments of the School. Course co-ordinators establish close co-ordination of the programme. Skills-training, clinical training and theory are integrated. Clinical sessions start with a group discussion and end with an evaluation session.**

**A strong characteristic of the programme is comprehensive patient care in the last semesters.**

### **3. FACILITIES**

The overall facilities of the school are excellent. Renovations are being implemented, which will result in the further enhancement of the learning and research environment.

### **4. EDUCATIONAL APPROACHES**

The major part of the curriculum comprises clinical learning experiences and PBL with small study-group and self study. Other resources used are lectures, seminars, skill-laboratories and IT.

### **5. EXAMINATIONS AND ASSESSMENT**

There is a process of self, peer and staff assessment throughout the curriculum, both in the theoretical and practical parts, as a means of continuous feedback. A summative assessment is held for each of the courses. Clinical assessments take place in the third, sixth and ninth course. For these assessments a range of methods is used and the students are graded pass or fail.

### **6. STUDENTS**

Forty students are admitted per year through the central Swedish application system, based on grades. Between 31 and 38 students qualify as dentists every year.

In addition 16 dental technicians qualify per year and 16 dental hygienists every second year.

### **7. STAFF**

The staff-student ratio is 1 to 4 (professors included). There is limited use of part time staff. There is good administrative and technical support staff. The age profile of the professorial staff is high and a number will retire soon.

### **8. INTERNATIONAL EXPOSURE**

Links have been established with a small number of schools in Europe, but this is of a limited nature. There is strong link with WHO through the Schools' role as a WHO Collaborating Centre, compiling and managing a database about oral health and dental status in all member countries of the United Nations.

Many of the senior staff have developed an international reputation in their own discipline. In the field of education and educational research the School has a very strong reputation throughout the world.

## 9. QUALITY ASSURANCE

The Faculty Board formally approved the quality management and enhancement program in 1996. The document 'Self-Assessment of Undergraduate Education' was published in 1997. Quality management and enhancement is maintained continuously under the guidance of the Committee for Undergraduate Education.

Faculty and staff development consists of three main areas: general insights, knowledge in oral health sciences and educational competence.

Student evaluation of the programme and courses is carried out continuously.

## 10. STRENGTHS

- Enthusiastic, committed and well-trained academic and support staff throughout the Centre.
- close cooperation between oral health staff and the medical and basic science teachers
- clear overall and specific aims and objectives for all parts of the curriculum
- an innovative self directed learning program for students
- the integration of medical and basic sciences in a longitudinal way into clinical oral situations
- exposure to clinical situations early in the curriculum
- continuous (self) assessment as a means of continuous feedback
- a holistic and integrated approach towards patient care
- continuous evaluation and development of the curriculum
- facilities have been upgraded to a high standard in parts of the building
- good research output, particularly in clinical research.
- availability of patients is good
- close collaboration with Public Dental Service in patient care/postgraduate training
- enthusiastic and responsive students
- students are actively involved in development of the school policies and the curriculum

## 11. WEAKNESSES

- some students have difficulty in adapting to the curriculum in the first year
- some staff have difficulty in coping with the new style programme
- the overall concept of comprehensive patient care and the existence of separate clinical units for specific disciplines could be divisive.
- the limited role of 'teamwork' among students in patient care.
- limited opportunities for international exchange
- limited exposure to special needs patients

## 12. INNOVATIONS

- international key role in education and educational innovations
- integrated oral health courses in programme
- the Oral Eco system introduced in the first year



- **co-ordination of clinical training with the medical and basic sciences**
- **students' research projects are introduced at an early stage**
- **clear objectives for each course**
- **the assessment system matches objectives**
- **self-assessment by staff and students**
- **continuous staff development program**
- **external examiners drawn from the Public Health Service**
- **assessment of students' critical skills**

### **13. RECOMMENDATIONS**

- **continue restoration/renovation of facilities**
- **replacement of senior staff when they retire**
- **development of oral biology unit plus facilities**
- **centralisation of research-laboratories**
- **review the balance between comprehensive patient care and the position of clinical units**
- **monitoring and recording of patient treatments carried out by students with for example reflective log books**
- **create markers regarding content and volume of subjects in the courses**
- **introduction of a computerised patient-management system**
- **survey of graduate satisfaction and career profile**
- **recognition of educational research in promotional process**
- **expand and co-ordinate research-capacity**
- **increase number of post doctoral positions**
- **explore opportunity for collaborative research /EU funding**
- **obtain university funding to support student research internationally**
- **continue to cultivate a holistic attitude towards patient care**