

Three years postgraduate programme in orthodontics

Final report Erasmus project*

Summary. A new curriculum with a common contents of 75%, leaving 25% for electives has been developed for a three year programme for specialty education in orthodontics.

The result is a joint effort of the original eight participants and invited professors from Italy and Ireland as well as from five non-EEC countries (Austria, Finland, Norway, Sweden and Switzerland). Unanimity among the 15 participants was reached on all essential matters and on the contents of the final report.

The main objective of the programme has been defined and the different courses have been formulated in terms of goals to be accomplished in three levels of comprehension and by the minimal hours students must devote to each subject. Furthermore, procedures that should be mastered have been specified.

VAN DER LINDEN FPGM, BOLENDER C, CANUT JA et al. Three years postgraduate programme in orthodontics. Final report Erasmus project. Ned Tijdschr Tandheelkd 1992; 99: 253-8.

F.P.G.M. van der Linden, orthodontist

Uit de vakgroep Orthodontie van de Faculteit der Medische Wetenschappen, van de Katholieke Universiteit te Nijmegen.

Trefwoorden: **Orthodontie – Onderwijs**

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Adres: Prof. Dr. F.P.G.M. van der Linden, postbus 9101, 6500 HB Nijmegen.

1 Introduction

In October 1989 an application was submitted to the ERASMUS Bureau of the European Cultural Foundation of the Commission of the European Communities for the joint development of a new three years curriculum for postgraduate education in orthodontics by the first eight persons listed above and their Universities.

After the grant application was approved and funded, the first meeting took place in June 1990 in Copenhagen. At that meeting it was decided to invite M. Ronchin from Italy and colleagues from non-EEC countries, P. Rygh from Norway, S. Linder-Aronson from Sweden, O. Rönning from Finland and J.P. Joho from Switzerland, to take part in the activities involved in developing the new curriculum. At the second meeting in Amsterdam in September 1990, it was decided to invite also M. Hegarty from Ireland and H. Droschl from Austria. The third meeting scheduled in Berlin in January 1991 had to be cancelled in view of risks associated with the Gulf war. To minimize delay in progress, the meeting plan-

ned for London at the end of May and beginning of June was extended and matters were dealt with by mail to a greater extent than originally intended. The final meeting planned in Bled in early September had to be postponed owing to internal unrest in Yugoslavia and was held in London on November 9 and 10, 1991. In the meantime the tragic death in August of Prof. Houston, who had contributed so much to this project, called for replacement. That also applied to Prof. Ronchin who had to withdraw for personal reasons. Prof. J.P. Moss from the United Kingdom and Prof. R. Martina from Italy were invited and accepted to fill in the vacancies.

The main reason for initiating a common curriculum was to reduce the diversity in length, intensity and contents of existing programmes and to develop guidelines for countries anticipating to embark on postgraduate education in orthodontics. Moreover, the freedom of exchange of orthodontists within the EEC countries calls for a consensus of educational standards. The Erasmus project has actually a two fold

objective, namely to improve the quality of specialty education in the EEC countries and thereby the quality of patient care. At present, orthodontics has become a highly sophisticated health care service, that can provide excellent treatment of malocclusion and facial deformity, based on the premise that this treatment is given by well educated, skilled and experienced specialists. Therefore, adequately qualified manpower is the key to providing the best possible service to the population.

The description of the programme submitted in the application to the ERASMUS Bureau was as follows:

'The joint preparation of an entire three years common curriculum within the European Community for the education in Orthodontics, based on new concepts. The programme should be founded on a description of clearly defined goals and requirements.

The new curriculum should have a common contents of about 75 %, leaving 25 % for electives. A certain part of the programme should be suited for the exchange of students among the participating countries.'

Participants:

Prof. C. Bolender,
Louis Pasteur University, Strasbourg, France
Prof. J.A. Canut,
University of Valencia, Spain
Prof. L. Dermaut,
University of Gent, Belgium
Prof. W.J.B. Houston (died Aug. '91),
University of London, United Kingdom
Prof. J.P. Moss (from Sept. '91),
University of London, United Kingdom
Prof. B. Melsen,
University of Århus, Denmark
Prof. R.R. Miethke,
Free University Berlin, Germany

Prof. M.N. Spyropoulos,
University of Athens, Greece
Prof. F.P.G.M. van der Linden,
University of Nijmegen, The Netherlands
Prof. J.P. Joho,
University of Geneva, Switzerland
Prof. S. Linder-Aronson,
Karolinska Institutet, Stockholm, Sweden
Prof. O. Rönning,
University of Turku, Finland
Prof. P. Rygh,
University of Bergen, Norway
Prof. M. Ronchin, (until Sept. '91),
University of Cagliari, Italy

Prof. R. Martina (from Sept. '91),
University of Napels, Italy
Prof. M. Hegarty,
University of Cork, Ireland
Prof. H. Droschl,
University of Graz, Austria

Advisor:

Prof. Em. C.F.A. Moorrees,
Harvard University, Boston, Ma., USA

*Coordinator and reporter:
F.P.G.M. van der Linden

In the application, the action plan included a second year to complete the task formulated as:

'Preparation of the final version of the curriculum. Agreement should be reached on goals, teaching activities, requirements, electives and exchange conditions.'

This part of the action plan has been carried out already, except for the formulation of exchange conditions. It turned out to be unrealistic to define these conditions prior to establishing the common programme in various countries.

Worldwide existing information on postgraduate programmes in orthodontics was collected and evaluated prior to the development of the new curriculum. Furthermore, the directives of the Commission of the European Communities on Dental Education (1986), regarding the education of orthodontists, have been taken into account.¹

The participants listed above had the opportunity to discuss in detail the gathered information and various aspects associated with the education of orthodontists. Consensus was reached in all essential matters. The statements, conclusions and the content of the programme presented in this report are supported unanimously.

2 Main objective of the programme for specialty education in orthodontics

The general objective of the programme is to educate dentists to become specialists in orthodontics with a solid and broad academic background and adequate clinical experience in different treatment methods.

The graduate should be able to:

- diagnose anomalies of the dentition, facial structures and functional conditions
- detect deviations of the development of the dentition, of facial growth, and occurrence of functional abnormalities
- formulate a treatment plan and predict its course
- evaluate psychological aspects relevant to orthodontics
- conduct interceptive orthodontic measures
- execute simple and complex treatment procedures
- act as an expert in orthodontics and related matters
- collaborate in multidisciplinary teams for treatment of compromised patients, orthodontic-surgical treatment and care of cleft palate patients
- evaluate need for orthodontic treatment
- practice orthodontics with high professional and ethical standards
- use available opportunities for improving professional skills

In addition, emphasis is placed on:

- biomedical sciences relevant to ortho-

odontics

- development of a scientific attitude in an inquiring mind and stimulation of professional interest
- principles of scientific methodology
- interpretation of literature
- research activities
- oral and written presentation of clinical and research findings

3 General conditions

1. The education of orthodontists must² take place within universities under responsibility of appointed academic teachers in orthodontics.
2. Candidates must be qualified as dentists.
3. The basic objective of the programme is to educate clinicians; additional education is needed for those who also want to become a teacher/researcher.
4. The programme requires full time attendance of the students.
5. Students should receive a stipend for living expenses.
6. Each student must start a minimum of 50 well documented patients.
7. Specification of the minimal number of hours students must spend is provided for the obligatory academic courses but is not indicated in detail for the preclinical and clinical activities.
8. The core programme requires 75 % of the available time and must be supplemented for the remaining 25 % by additional activities (electives) that will vary according to the individual institution and the needs of the students. Such activities include: extension of the obligatory course work, special courses, additional clinical experience, more teaching engagements, supplementary research activities, evaluation of treatment accomplishments, as well as attending guest lectures and scientific meetings.
9. The minimal number of clinical treatment hours is 16 hours per week (not including clinical seminars and discussion of treatment plans). The minimal number of hours over the three year period devoted to clinical practice (including preclinical laboratory hours) is 2000.
10. The clinical staff-student ratio in supervising treatments must be at least 1:6.
11. Students must treat patients under continuous supervision of qualified orthodontists.
12. Dental laboratory work should be limited to learning experiences.
13. Besides the theoretical and practical training in 'classical' orthodontics, students must gain experience in the treatment of patients that require a multidisciplinary approach and particularly

orthognathic surgery.

14. Students must either treat cleft palate patients or be exposed to this type of treatment in clinics or centres notwithstanding the fact that they may not necessarily treat cleft palate patients later on.
15. Mounting dental casts in an articulator is required for patients with TMJ-, surgical and complex restorative problems.
16. Teaching of undergraduate dental students can be part of the programme, but not for more than 10 % of the time.
17. Students must conduct a research project (clinical, experimental or literature research) and report their findings and conclusions in a thesis or written report.
18. Results of research and other activities undertaken in the postgraduate programme in orthodontics can be used without limitation as partial fulfilment of requirements for an advanced degree.
19. All academic theoretical courses must be concluded with an assessment of the understanding and knowledge acquired by the students.
20. At the end of the programme there must be a final examination by a committee including at least one external examiner.
21. Part of the final examination is the presentation of completed treatment records and documented results of 10 patients for evaluation, representing different malocclusions and treatment procedures, started and completed by the student (patients may still be in retention).

4 Specific conditions for specialty education in orthodontics

1. The director of the programme must be:
 - registered as a specialist in orthodontics for at least five years
 - actively practising the specialty
 - appointed for at least 80 % of the working week
2. Besides the director, the equivalent of one full time position for an orthodontist must be present. When more than a total of four postgraduate students is enrolled, additional orthodontic staff is required.
3. Adequate library, laboratory, clinical, research and administrative facilities must be available in suitable premises.
4. Sufficient non-academic staff must be available to realize an efficient conduct of the teaching programme and patient care.
5. An established connection with centres for oral and maxillofacial surgery, periodontology and restorative dentistry is required.
6. Sufficient expertise must be available to

Tabel 1. Assignment of the 4800 scheduled hours.

<i>Staff/student contact activities (± 63%)</i>	
– clinical (and preclinical) practical work	2000 hrs
– pretreatment clinical conferences	230 hrs
– seminars on treatment evaluation	100 hrs
– lectures, seminars, workshops on obligatory academic courses	455 hrs
– lectures, seminars, workshops on elective theoretical subjects	150 hrs
– staff/student contact time outside regular classes for individual consultations, research guidance, manuscript preparation etc.	115 hrs
	<u>3.050 hrs</u>
<i>Non staff/student contact activities (± 37%)</i>	
– analysis of records of patients to be treated	120 hrs
– undergraduate teaching, including preparation time (10% of 4800 hrs)	480 hrs
– research	100 hrs
– elective activities (including additional time for research)	1050 hrs
	<u>1.750 hrs</u>
	<u>4.800 hrs</u>

realize the objectives of teaching *general biological and medical subjects*, and *basic orthodontic subjects*.

7. Research opportunities, statistical assistance and computer facilities must be available.

5 Orthodontic programme: distribution of hours

It is essential that there is a correct balance in the orthodontic curriculum. The academic programme is based on a minimum of 40 weeks a year and 40 hours a week, which totals 4800 scheduled hours for three years (Tab. 1). Of the scheduled 4800 hours, 25 % is assigned for electives (150 + 1050 = 1200 hours)

In addition, students are required to put in a considerable number of hours of their own time for studying. For example, for every class hour on academic subjects, an average two hours studying time are required.

6 Objectives of obligatory courses for education of orthodontists³

The hours indicated in parentheses in the following sections are the minimal number of hours necessary for the average student to devote to the subject to reach the specified level of comprehension or competence. At least one third of these hours must be spent in staff-student contact activities (lectures, seminars, workshops etc.).

A. GENERAL BIOLOGICAL AND MEDICAL SUBJECTS

1. *Growth and development of the human body* (25 hrs)

Insight in:

- somatic growth and its variations
- adolescent growth spurt and its relation to growth of the craniofacial complex

Familiar with:

- genetic and environmental factors that influence somatic growth
- concept of biological age and determination of skeletal age, dental age, and stages of sexual development

2. *Anatomy of the head* (35 hrs)

Knowledge of:

- anatomical features, tissue systems and functional anatomy essential for comprehension of:
 - growth of the craniofacial skeleton
 - development of skeletal deformities
 - dentofacial orthopedics
 - orthognathic surgical correction of facial dysmorphism and malocclusion

3. *Genetics* (25 hrs)

Familiar with:

- genetic principles essential for comprehension of:
 - the development of the head
 - craniofacial malformations

4. *Embryology of the head* (25 hrs)

Insight in:

- embryology of craniofacial structures for understanding of normal growth and development of face, jaws and teeth, teratogenesis and development of clefts and other facial congenital malformations

5. *Cell Biology* (30 hrs)

Insight in:

- cytological and histochemical aspects essential for the understanding of:
 - cell metabolism under normal and abnormal conditions
 - tissue formation and proliferation
 - development of bone, cartilage, teeth and muscle
 - facial growth
 - temporomandibular joint
 - tooth movements and reactions in tooth supporting tissues
 - dentofacial orthopedics
 - soft tissue changes related to orthodontics
 - mechanisms of root resorption

6. *Physiology of breathing, speech, swallowing and mastication* (20 hrs)

Knowledge of:

- oronasal aspects of different modes of breathing

Familiar with:

- normal and abnormal speech
- various ways of swallowing
- the process of mastication

7. *Syndromes in which the head is involved* (20 hrs)

Familiar with:

- principles of classification of syndromes in relation to aetiology, prognosis and reaction to orthodontic and orthognathic surgery treatment

8. *Psychology of the child, adolescent and adult* (35 hrs)

Insight in:

- concepts and principles of developmental psychology
- potential and limitation in behaviour modification
- aspects of patient motivation and assessment of cooperation
- psychological aspects of puberty and adolescence
- impact of facial appearance on self esteem
- psychological aspects of orthognathic surgery

9. *Biostatistics* (45 hrs)

Insight in:

- statistical methodology

Familiar with:

- commonly used statistical methods
- data processing procedures

Competent to:

- understand and evaluate statistical aspects in current literature
- evaluate validity of statistical methodology and interpretation of findings in clinical and research papers relevant to orthodontics and related subjects

10. *Epidemiology* (10 hrs)

Familiar with:

- principles of epidemiologic surveys
- research designs

- sample composition and requirements for control groups
- data analysis and critical interpretation of findings

11. *Research methodology* (35 hrs)

Familiar with:

- philosophy of science
- ethical aspects of research on animals and humans

Insight in:

- various methods of research design

Competent to:

- perform an analytical review of biomedical research and clinical research papers
- write a protocol for a research project
- interpret own research findings
- evaluate validity of conclusions in research papers
- present research findings in oral and written form

B. BASIC ORTHODONTIC SUBJECTS

1. *Development of the dentition (normal and abnormal)* (60 hrs)

Knowledge of:

- the development of normal occlusion from birth to adulthood
- variations in this development
- abnormalities in number, size, form and position of teeth
- genetic and environmental factors relevant to the development of the dentition
- developmental patterns of different malocclusions, also with consideration of severity
- effect of agenesis and supernumerary teeth as well as (premature) loss or extraction of deciduous and permanent teeth on the development of the dentition

Competent to:

- recognise and identify a given situation of the dentition in terms of:
 - normality or abnormality
 - developmental stage attained
 - future development
 - possibilities for interceptive measures to improve the ultimate situation

2. *Facial growth (normal and abnormal)* (50 hrs)

Insight in:

- growth of cartilage, bone and muscle

Knowledge of:

- growth sites in the craniofacial skeleton
- postnatal growth changes in the craniofacial region, including soft tissues
- variation in the function of components within the craniofacial region relevant to facial growth
- individual variation in facial configuration
- influence of environmental factors on facial growth

3. *Physiology and pathophysiology of the stomatognathic system* (35 hrs)

Knowledge of:

- normal and abnormal functional occlusion of the dentition
- normal and abnormal behaviour of soft tissue structures
- normal and abnormal functioning of the temporomandibular joint
- diagnostic procedures regarding the temporomandibular joint
- treatment procedures of temporomandibular joint disorders

4. *Aspects of tooth movements and dentofacial orthopedics* (35 hrs)

Knowledge of:

- process of tooth eruption and spontaneous tooth movement
- effect of different types of force application on cells and tissues
- influence of force systems and force magnitude
- posttreatment changes
- cellular aspects of endochondral growth in the nasal septum, condyles and epiphyses, and bone growth at sutures and bone surfaces
- effect of dentofacial orthopedic measures on tissue systems
- relation between adaptability of tissues and results of dentofacial orthopedic measures

5. *Radiology and other imaging techniques* (30 hrs)

Knowledge of:

- abnormalities and pathologic conditions that can be diagnosed on radiographs

Insight in:

- methods and risks involved in making radiographs for orthodontic purposes

Familiar with:

- digital radiographic and other imaging techniques

6. *Cephalometrics (including tracings)* (45 hrs)

Competent to:

- identify relevant anatomical structures on cephalograms
- describe the morphology of the head on basis of cephalograms
- make tracings of cephalograms in norma lateralis and frontalis that include essential contours
- perform several cephalometric diagnostic analyses on tracings

Knowledge of:

- limitations of cephalograms and their analyses

7. *Orthodontic materials* (25 hrs)

Insight in:

- property and composition of orthodontic materials

Knowledge of:

- parameters for selection of correct material for various orthodontic procedures
- proper handling and application of orthodontic materials

8. *Orthodontic biomechanics* (35 hrs)

Competent to:

- understand basic principles of statics and mechanics of materials
- relate principles of mechanics to clinical and research problems
- solve problems related to force resultants and force equivalents
- estimate forces produced by different orthodontic appliances
- estimate forces produced by dentofacial orthopedic devices

C. GENERAL ORTHODONTIC SUBJECTS

1. *Aetiology* (25 hrs)

Insight in:

- genetic and environmental factors that influence postnatal development of the dentition and facial growth

Knowledge of:

- unfavourable influence of environmental factors and their interception

2. *Diagnostic procedures* (15 hrs)

Competent to:

- obtain a relevant patient history
- perform a thorough clinical examination
- determine habitual occlusion, evaluate functional occlusion and different jaw relations of patients
- evaluate influence of functional components of soft tissues on dentofacial morphology
- take high quality impressions of the dentition with a maximal reproduction of alveolar processes
- make face bow registrations and mount dental casts in an articulator
- take good extra-oral and intra-oral photographs
- take good radiographs necessary for orthodontic purposes

3. *Orthodontic diagnostic assessment, treatment objectives, and treatment planning* (60 hrs)

Competent to:

- arrive at a tentative diagnostic assessment and classification on the basis of a cursory examination of a patient
- provide advice after a cursory examination concerning feasibility of treatment, need for more detailed analysis and treatment planning or consultation of other specialists for further evaluation and treatment
- arrive at a proper diagnostic assessment on the basis of anamnestic data, patient examination, dental casts, photographs, radiographs, cephalograms and other relevant data
- predict the likely effect on growth and development of face and dentition if no therapy is implemented
- define objectives of treatment with due consideration of alternatives
- define a treatment plan for various types of

orthodontic and dentofacial abnormalities, including strategy of treatment and retention, therapeutic measures, timing and sequence of their application, prognosis and estimated treatment time and retention time.

4. *Growth and treatment analysis* (35 hrs)

Knowledge of:

- potential and limitation of different methods of longitudinal cephalometric assessment.
- limitation of analyses of growth and treatment changes
- validity and limitation of growth prediction including computerized prediction

Competent to:

- perform growth analyses based on serial cephalograms
- detect treatment changes by analysis of tracings obtained at critical stages of treatment

5. *Long term effect of orthodontic treatment* (30 hrs)

Knowledge of:

- relapse associated with different anomalies and treatment procedures
- changes that can take place during retention period
- changes that can occur after retention has been terminated

Competent to:

- predict the probable long term effect of orthodontic treatment in individual patients

6. *Iatrogenic effects of orthodontic treatment* (30 hrs)

Knowledge of:

- risk involved in different treatment and retention procedures
- influence of various conditions and age ranges on iatrogenic effects
- possible influence of treatment on temporomandibular joints
- effect of different types of treatment on periodontal tissues in the long run
- factors involved in root resorption
- possible influence of treatment on facial expressivity
- possible influence of treatment on dentofacial appearance and esthetics

7. *Epidemiology in orthodontic research* (35 hrs)

Insight in:

- basic principles of epidemiology
- prevalence and incidence of orthodontic anomalies
- validity of indices in estimating need for treatment
- models to determine the demand for treatment
- influence of society on demand for treatment
- aspects involved in subjective need for treatment
- role played by orthodontists in demand for treatment
- factors involved in estimating objective need

8. *Orthodontic literature* (120 hrs)

Familiar with:

- various orthodontic journals

Competent to:

- detect essentials in current literature (taught in specific literature review sessions)
- present concise and analytic literature reviews

D. ORTHODONTIC TECHNIQUES

1. *Removable appliances* (30 hrs)

Knowledge of:

- indication, design and use of removable appliances
- potential and limitation of removable appliances

Competent to:

- construct and repair removable appliances

2. *Functional appliances* (40 hrs)

Knowledge of:

- indication, design and use of functional appliances
- potential and limitation of functional appliances

Familiar with:

- different varieties, designs and constructions of functional appliances

Competent to:

- construct and repair functional appliances

3. *Extra-oral appliances*⁴ (25 hrs)

Knowledge of:

- indication, design and use of various types of headgears, facial masks, chin caps, and combined extra-oral / functional appliances
- potential and limitation of these appliances

4. *Partial fixed appliances* (25 hrs)

Knowledge of:

- indication and application of partial fixed appliances (e.g. lingual, palatal and vestibular arches, rapid maxillary expansion devices, and partially banded/bonded dental arches)
- potential and limitation of different approaches in partial fixed appliance therapy

5. *Fixed appliances* (60 hrs)

Insight in:

- indication and application of fixed appliances
- different concepts and treatment approaches in design and biomechanical principles of fixed appliance therapy
- potential and limitation of different appliance systems

Knowledge of:

- at least one type of full fixed appliance

6. *Retention appliances* (15 hrs)

Knowledge of:

- indication and contra-indication, design and use of retention appliances
- potential and limitation of retention appli-

ances

- the most appropriate duration of retention

E. MULTIDISCIPLINARY TREATMENT PROCEDURES

1. *Cleft palate treatment* (20 hrs)

Insight in:

- multidisciplinary approaches in treatment of cleft palate patients
- indication, timing and application of multidisciplinary treatment of cleft palate patients
- specific aspects of orthodontic treatment in cleft palate patients

2. *Orthodontic-surgical treatment* (20 hrs)

Knowledge of:

- indication and application of combined orthodontic-surgical treatments
- specific aspects of orthodontic treatment in patients requiring orthognathic surgery

3. *Orthodontic-periodontal treatment* (20 hrs)

Knowledge of:

- indication and contra-indication of orthodontic treatment in periodontally compromised dentitions
- specific aspects of orthodontic treatment in periodontally compromised dentitions
- contribution of orthodontic treatment to the periodontal condition of patients

4. *Orthodontic-restorative treatment* (10 hrs)

Knowledge of:

- indication and application of combined orthodontic-restorative treatment
- specific aspects of orthodontic treatment in combined orthodontic-restorative patient care

F. SPECIFIC TREATMENT PROCEDURES

1. *Guiding the development of occlusion*⁵ (10 hrs)

Knowledge of:

- indication and contra-indication of interceptive measures

2. *Adult orthodontics* (15 hrs)

Knowledge of:

- indication and specific aspects of orthodontic treatment of adults
- treatment of adult patients in collaboration with general dental practitioners

3. *Craniomandibular dysfunction* (40 hrs)

Familiar with:

- aetiology of craniomandibular dysfunction
- general measures to improve craniomandibular dysfunction
- various therapeutic procedures

Knowledge of:

- indication and contra-indication for orthodontic treatment in patients with cranioman-

dibular dysfunction

- possible implications of orthodontic treatment in the presence of craniomandibular dysfunction
- appropriate orthodontic procedures contributing to the treatment of patients with craniomandibular dysfunction by a team of specialists

G. MANAGEMENT OF HEALTH AND SAFETY

1. Management of oral health (15 hrs)

Insight in:

- specific aetiological features encountered in orthodontic practice regarding development of dental caries, periodontal problems, and soft tissue lesions

Knowledge of:

- procedures to detect a high risk of developing dental caries in patients
- procedures to detect a high risk of developing periodontal problems in patients

Competent to:

- instruct patients to maintain optimal oral hygiene as a preventive measure for gingival and dental lesions

2. Health and safety conditions in an orthodontic practice (5 hrs)

Knowledge of:

- prevention of cross infection
- methods of sterilisation of instruments
- management of high risk patients
- control of substances hazardous to health for patients and personnel

H. PRACTICE MANAGEMENT, ADMINISTRATION AND ETHICS

1. Office management (15 hrs)

Insight in:

- design of an orthodontic practise
- equipment and instruments needed in an orthodontic practise
- recruitment and selection of auxiliary personnel
- training and quality control of auxiliary personnel
- financing and administration of an orthodontic practise
- public relations

2. Use of computers⁶ (10 hrs)

Familiar with:

- utilization of computers in clinical orthodontics and patient management

3. Ergonomy (5 hrs)

Knowledge of:

- optimal position of patient, orthodontist, chair-side assistant and placement of instruments to conduct specific clinical tasks
- most efficient sequence to perform specific clinical procedures

4. Legislation (10 hrs)

Insight in:

- rules and laws that apply to an orthodontic practise
- responsibilities and services vulnerable to malpractice law suits
- different insurance coverages required
- procedures to follow when a law suit arises

5. Professional ethics (5 hrs)

Knowledge of:

- behaviour and conduct expected of an orthodontist as health care provider
- ethical standards that apply to relations with personal, patients and colleagues

Notes

¹ Advisory Committee on the training of dental practitioners report on the field of activity and training programmes for dental specialists: III/D/1374/5/84-EN.

² *must*: indicates an imperative or duty, mandatory; *should*: indicates highly desirably, but not mandatory; *can*: indicates freedom or liberty to follow an alternative.

³ Three levels of comprehension have been distinguished and are indicated by the terms: *familiar with*; *insight in*; *knowledge of*. With the term *competent to* is meant that the procedure described can be performed without assistance.

⁴ A major part of the section is covered in B.4: Aspects of tooth movements and dentofacial orthopedics.

⁵ A major part of this subject is incorporated in B.1: Development of the dentition

⁶ Students should preferably have a personal computer that operates on a compatible base with those in the teaching institution.

Toelichting bij het Erasmus rapport

In 1962 is Nederland als eerste land in Europa begonnen met een gestructureerde opleiding van orthodontisten. Het daarvoor ingevoerde programma is cursorisch van opzet, duurt vier jaar en wordt eenmaal in de twee jaar met vier tot vijf assistenten gestart. In vele andere landen in Europa laat de opleiding tot orthodontist, qua inhoud, organisatie, duur en criteria waaraan moet worden voldaan, het nodige te wensen over. Bovendien ontbreekt veelal een beoordeling van het bereikte kennis- en vaardigheidsniveau. Een gevolg van een en ander is dat, internationaal gezien, de opleiding tot orthodontist in Nederland op hoog niveau staat. Dat geldt ook voor de kwaliteit van de door orthodontisten uitgevoerde behandelingen, hetgeen mede aan de gunstige vergoedingsregelingen van Ziekenfondsen en Particuliere Verzekeraars te danken is.

Het verschil in opleidingsniveau tussen in Nederland en daarbuiten opgeleide orthodontisten werd een punt van zorg voor het Centraal College en de Specialisten Registratie Commissie toen enige jaren geleden het recht tot praktijkuitoefening tot alle landen van de EEG werd uitgebreid voor hen die in één van die landen als specialist waren ingeschreven. Dit heeft geleid tot het Erasmus Ortho Project waarvan het eindrapport hier wordt gepresenteerd.

De voornaamste doelstelling van het Erasmus Ortho Project is het reduceren van de grote diversiteit in lengte, kwaliteit en inhoud van de bestaande programma's. De vrije vestigingsmogelijkheden binnen EEG-

landen roept immers de wens op om te komen tot een consensus van onderwijsseisen en -normen. Met het verbeteren en uniformeren van de opleiding wordt bovendien een verhoging van het niveau van de specialistische orthodontische behandeling in Europa beoogd. Goed gekwalificeerde beroepsuitoefenaren vormen namelijk de sleutel tot het verstrekken van een zo goed mogelijke zorgverlening.

Aan de activiteiten van het Erasmus Ortho Project hebben hoofden van universitaire afdelingen orthodontie uit 15 landen deelgenomen. Op alle essentiële punten is consensus bereikt en het eindrapport is unaniem door alle deelnemers onderschreven. Het is de bedoeling dat het vastgelegde programma op de participerende universiteiten binnen afzienbare tijd wordt ingevoerd. Verwacht mag worden dat ook andere opleidingscentra in de betrokken landen deze weg zullen gaan en dat in het begin van de volgende eeuw het programma breedschalig zal zijn ingevoerd.

Wat de Nederlandse situatie betreft zal de implementatie van het vastgelegde programma slechts een beperkte wijziging van de inhoud van de bestaande curricula betekenen. Ze zullen wel geïntensiveerd moeten worden omdat op termijn de opleiding waarschijnlijk tot drie jaar moet worden teruggebracht. De 'Commission of the European Communities on Dental Education' heeft namelijk in 1986 vastgesteld dat de opleiding van specialisten in de orthodontie drie jaar hoort te zijn.

F.P.G.M. van der Linden

Commentaar op het Erasmus rapport

Na de erkenning in 1953 van de orthodontie (dento-maxillaire orthopedie) als eerste specialisme in de tandheelkunde in Nederland werd aan de universiteiten waar een subfaculteit tandheelkunde bestond, een opleiding tot specialist orthodontist ingesteld. Sindsdien heeft dit specialisme in ons land een sterke ontwikkeling doorgemaakt welke zich gaandeweg heeft gemanifesteerd in een opbloei van wetenschappelijk onderzoek en in een verbetering van de zorgverlening welke thans kwalitatief aan hoge eisen kan voldoen.

De controle op de kwaliteit van de opleiding, de toelating tot het Specialistenregister (in 1956 volgde de erkenning van het specialisme kaakchirurgie) en de positie van specialisten wordt geregeld door het Centraal College en de Specialisten Registratie Commissie die daartoe eisen en voorwaarden hebben opgesteld in overleg met overheid en beroepsorganisatie.

Aanvankelijk onderscheidde de opleiding tot specialist orthodontist in Nederland zich nauwelijks van andere specialistische opleidingen in de geneeskunde en de tandheelkunde. De assistent in opleiding werd in hoofdzaak klinisch geschoold. De theoretische kennis werd veelal vergaard door zelfstudie en voorts vormden stafbesprekingen en klinische avonden, voornamelijk gerelateerd aan de patiëntenbehandeling, een belangrijke bijdrage. Na een bepaald aantal jaren vond beoordeling door de opleider plaats en volgde inschrijving in het Specialistenregister.

De vanaf 1962 te Nijmegen (Prof.Dr. F.P.G.M. van der Linden) ingevoerde *gestructureerde* opleiding tot specialist-orthodontist heeft nadien ook aan andere Nederlandse universiteiten als voorbeeld gediend.

Wanneer men thans het voorliggende Erasmus programma beziet, dan vindt men hierin vele kenmerken van de Nederlandse specialistenopleiding terug. Het blijkt dat de oorspronkelijke ideeën van Van der Linden grotendeels ook in andere Europese landen zijn overgenomen. De omschrijving van de aan de gekwalificeerde specialist te stellen eisen en vervolgens van de voorwaarden voor de opzet en uitvoering van de opleiding, staf, personeel en faciliteiten is inderdaad een aanzet tot het streven naar een gelijkwaardig opleidingsniveau en kan voorts dienen als basis voor de (re)organisatie en financiering van een specialistenopleiding. Het is van belang dat, hoewel de opleiding tot clinicus vooropstaat, een academische achtergrond en wetenschappelijk inzicht van de orthodontist worden benadrukt, reden waarom de opleiding primair aan een *universitaire* kliniek dient plaats te vinden.

Hoewel uitwisseling in het programma wordt overwogen, dringt de vraag zich op of in de ontwikkelingsperiode van een opleiding wellicht de mogelijkheid moet worden opengelaten voor een extra-universitaire klinische stage. Deze vraag kan ook aan de orde komen in verband met de vereiste ervaring in verschillende behandelingsmethoden.

Een ander kenmerk is het *cursorische karakter* en de omschrijving van de theoretische vakken in het verplichte deel van het opleidingsprogramma. Een nadere invulling van het niet voorgescreven deel wordt echter aan de opleider overgelaten. Door het afnemen van zogenaamde toetsen wordt het verzamelen van kennis in een bepaalde volgorde en ook binnen een bepaald tijdbestek bevorderd. De instelling van een afsluitend examen leidt er voorts toe dat bij inschrijving in het Specialistenregister zoveel mogelijk aan dezelfde criteria is voldaan. Ondanks mogelijke bezwaren tegen dit wat strakke keurslijf is in Nederland de ervaring dat hierdoor het rendement van de opleiding toeneemt en onderlinge vergelijking van opleidingen beter mogelijk wordt.

In het voorgestelde Erasmus programma valt echter één verschil onmiddellijk op, namelijk de duur van de opleiding. Deze wordt verdeeld over drie jaar (Nederland thans vier jaar) en neemt volgens het programma 4800 uur in beslag, met toevoeging van 1200 verplichte studie-uren, dus in totaal 6000 uur. De praktijk zal moeten leren of deze opleidingsduur voldoende zal blijken te zijn. In het verplichte opleidingsprogramma is 550 uur gereserveerd voor theoretische vakken en research. Aan de kliniek en voorts aan patiëntenbehandeling gerelateerde activiteiten en besprekingen wordt ongeveer 2450 uur besteed, hetgeen een verantwoorde verhouding lijkt (ongeveer 1:4).

De opzet en *inhoud* van het theoretische programma toont aan dat is ingezien dat veel gewicht moet worden toegekend aan de medisch-biologische scholing van de toekomstige orthodontist. Dit is te meer van belang gezien het feit dat bijvoorbeeld in ons land de medisch-biologische scholing van de aanstaande tandarts door verkorting van het curriculum in het gedrang is gekomen. Aangezien de kwaliteit van het klinisch handelen van de orthodontist in hoge mate afhankelijk is van de diagnostiek, gebaseerd op medisch-biologisch denken, moet het aantal uren gewijd aan de verplichte theoretische vakken als een minimum worden beschouwd. Het is ook duidelijk dat hiervoor docenten uit onder andere de medische faculteit zullen moeten worden aangetrokken. In dit verband en ook met het oog op de planning en uitvoering van research-activiteiten zal een goede samenwerking met andere faculteiten een voorwaarde moeten zijn.

Ten aanzien van de klinisch gerichte vakken en de klinische opleiding blijkt uit de inhoud van het voorliggende programma dat men gelukkig thans algemeen de mening is toegedaan dat de aanstaande orthodontist reeds tijdens zijn opleidingsperiode zowel theoretisch als praktisch moet worden geschoold in verschillende behandelingsmethoden. Bij de omschrijving van multidisciplinaire en specifieke behandelingswijzen wordt het echter niet voldoende duidelijk in welke mate hierin klinische ervaring zal worden vereist.

Hoewel niet expliciet in het programma ver-

meld, mag worden aangenomen dat ook voldoende tijd zal worden besteed aan onderwerpen als maatschappijleer, en organisatie en structuur van de gezondheidszorg.

Wanneer dit programma inderdaad binnen afzienbare tijd kan worden ingevoerd aan universiteiten in alle Europese landen, zal dit een belangrijke bijdrage betekenen in het streven naar een goed en gelijkwaardig opleidingsniveau. Collega Van der Linden verdient onze erkentelijkheid voor zijn initiatieven en activiteiten voor de totstandkoming. Behalve uitvoering van dit opleidingsprogramma zal in Europees verband ook gestreefd moeten worden naar samenwerking van landelijke registratiecommissies waarbij voor toelating zoveel mogelijk dezelfde criteria worden gehanteerd en uitwisseling van gegevens mogelijk wordt. Het streven naar uniformering van opleiding en van toelatingseisen zal ook de kwaliteit van de zorgverlening in Europa bevorderen en vestigingsproblemen verminderen. Wellicht kan dit Erasmusprogramma tevens een voorbeeldfunctie hebben voor andere specialistenopleidingen.

Wat Nederland betreft zal op termijn de opleidingsduur waarschijnlijk teruggebracht moeten worden tot drie jaar, hetgeen aanzienlijke organisatorische problemen met zich mee zal brengen. Behalve een intensivering van het opleidingsprogramma zal de tijd door assistenten in opleiding besteed aan begeleiding van tandheelkundige studenten dan moeten worden gereduceerd. Ook zal er minder tijd beschikbaar zijn voor onderzoek. Dit zou kunnen betekenen dat voor omvangrijk onderzoek, resulterend in een promotie, binnen de opleidingsduur te weinig tijd zal zijn. Dit bezwaar kan worden ondervangen door voorafgaand aan de specialisatie een of twee jaar voornamelijk aan onderzoek te wijden (AIO). Ook zou de afronding van een promotieonderzoek pas na het voltooiën van de specialistenopleiding kunnen plaatsvinden. De instelling van een vierde jaar te besteden aan research zal waarschijnlijk moeilijk te realiseren zijn gezien de reeds bestaande financieringsproblemen. De uitvoering van research zal dus mogelijk in de toekomst door bovengenoemde omstandigheden worden beperkt. Ondanks deze negatieve aspecten mag men hopen dat door begrip en samenwerking van en tussen universiteiten, overheid en beroepsorganisatie de kwaliteit van de specialistenopleiding en mede daardoor van de zorgverlening gehandhaafd kan blijven. In kwantitatieve zin zal verkorting van de studieduur in principe de mogelijkheid tot het opleiden van orthodontisten vergroten. Dit zal echter mede afhankelijk zijn van de beschikbaarheid van staf, faciliteiten en financiële middelen.

Dr. A.J. van Hilleghonsberg, orthodontist