EUROPEAN BOARD OF ORTHODONTICS

**AN ILLUSTRATED GUIDE TO PREPARE
FOR THE EXAMINATION
OF
THE EUROPEAN BOARD OF ORTHODONTICS**

5th edition 2020

H.S. DUTERLOO P-G. PLANCHÉ

About the Authors

Herman S. Duterloo DDS, Ph.D.
Specialist in orthodontics. Past Professor and Head, Dept. of Orthodontics University of Groningen, The Netherlands. First Chairman of the Examination Committee of the European Board of Orthodontics. Chairman of the Examination Committee of the Italian Board of Orthodontics. Past President of the Angle Society of Europe. Life member of the International Association of Dental Research. Life Member of the European Orthodontic Society. Member and Past President of the Dutch Society of Orthodontists.

Pierre-Georges Planché DDS (died 2018)
Specialist in Orthodontics. Past-Head of Clinics at the School of Odontology, Paris
Diplomat of the French Board of Orthodontics.
Member of the European Board of Orthodontics
Chairman of the Scientific Committee of the Angle Society of Europe
President of the Federation of French Orthodontic Societies

Acknowledgements

The authors thank:

Professor Kevin O'Brien, PhD, MSc, BDS, FDS, DOrthRCSEng, Former Editor, Journal of Orthodontics for granting permission to quote extensively from the publication: Sandler P J, Duterloo H S 2003 European Board of Orthodontists – a professional challenge. Journal of Orthodontics 30: 59-71.

Dr Alfred Rutz, Chairman of the EBO Examination Committee for his invaluable comments.

Dr Jean-Luis Marçon who prepared many of the photographs.

Pages 13, 15-22, 24-29, 39, 45, 46, 62-66 are reproduced with kind permission of the European Orthodontic Society.

Extracts from the article by Andrews L F 1972 The six keys to normal occlusion. American Journal of Orthodontics 62 (3): 296-309 are published with permission from the American Association of Orthodontists.

European Orthodontic Society
Flat 20, 49 Hallam Street, London W1W 6JN England
Telephone/ No: +44 (0) 20 7637 0367; Fax No: +44 (0) 20 7323 0410
e-mail: membership@eoseurope.org

Dedication

This book is dedicated to

Professor José Antonio Canut Brusola

1938-2006

Valencia, Spain

in recognition of his outstanding contribution to orthodontics in Europe.

Preface by Professor James Moss

Honorary Secretary of the European Board of Orthodontics 1997 - 2005

In 1993 the European Orthodontic Society (EOS) established a Committee to look at the problems in Europe of implementing the decisions of the Erasmus programme for the training of Orthodontists in Europe. The Committee put forward a suggestion as to how the examination of Orthodontists in Europe could be undertaken. Some of the problems in Europe were the multiplicity of nationalities, languages and training. However in 1996 the EOS formed the European Board of Orthodontics (EBO) that was the culmination of several years of effort to harmonise the standards of orthodontic treatment and training across Europe.

The purpose of the Board was to enhance the standards of orthodontic treatment throughout Europe by providing a standard against which Orthodontists who so desired could be judged, independently of national examinations and barriers. It was also felt that it would encourage the spirit of self-improvement among colleagues who are recognised specialists in orthodontics within countries in Europe and indicate that the Orthodontist has demonstrated a clinical standard of excellence. However membership of the EBO would not grant the right of practice in any country.

It was decided that an EBO Examination Committee should produce an examination where suitably trained Orthodontists would present the records of their work to the scrutiny of orthodontic colleagues. These would examine the work and pass a judgement as to whether the work was of a sufficiently high standard to warrant the title “Member of the European Board of Orthodontics” being given. The standards of orthodontic treatment are judged by an expert panel of European Orthodontists, nominated by the Council of the EOS from members of the EBO.

In order to set the standard, Dr Herman Duterloo was approached by the EOS to become the first Chairman of the Board and to develop an examination that was fair, anonymous, and set a high standard of treatment. The first examination was held in Valencia in 1997 and since then many Orthodontists have demonstrated the quality of their work. The examination procedure has evolved into a very fair and open examination and this is due to the hard work and thoughtfulness of the Chairman and the examiners.

After 6 years as Chairman, Herman Duterloo and one of the Examiners, Pierre Planché, have produced this helpful book in order to assist those people who wish to take the examination to produce their cases in the right format and explain what the examiners are looking for during the examination.
I would encourage you to read the book and then apply to take the examination and join the select body of Orthodontists who have become Members of the EBO.

PREFACE TO SECOND EDITION 2009

By Frank Weiland, President of the European Board of Orthodontics

Evaluation of the examination procedure and discussions with examiners and candidates indicated the need for some textual clarifications. The adaptations involve the eligibility to sit the examination, more detailed description of the types of required cases and some aspects of the examination procedure. It is recommended to read the text with care.
Developments also required certain changes of the organization. The European Board of Orthodontics is now run by the Board of Senators, consisting of the President of the Board, the Chair of the Examination Committee (nominated by EOS Council) and the Senator of the Members elected by EBO members. This body organizes the examination and decides about the eligibility of candidates to sit the exam.
With a growing number of members it would be wonderful to improve communication between the members. Several times in the past an EBO lunch was organized during the yearly EOS meeting. It is hoped that this tradition will be resumed in the near future, the long- term perspective being a regular social and professional interaction between the Members.

The process of preparation of cases and sitting the examination is an invaluable learning experience. The successful candidate will achieve an enormous amount of personal satisfaction. It is hoped that many colleagues will join the select body of Board-certified orthodontists.

The editing of the 2nd edition was mainly undertaken by Dr Duterloo. His work and valuable advice are gratefully acknowledged.

PREFACE TO THIRD EDITION 2011

By Frank Weiland, President of the European Board of Orthodontics

The development of the EBO is a work-in-progress. Discussions very clearly showed the amount of interest in Board certification among postgraduates and newly graduated orthodontists. The EBOs wishes to welcome this up-and-coming generation of colleagues by enabling them join the EBO. In addition to the normal pathway leading to full membership a new route towards "provisional membership" followed by full membership is now introduced. It is hoped that these changes are well accepted and numerous colleagues find the rewarding way towards Board-certification.

The support and contributions of Dr Herman Duterloo and Dr Mauro Cozzani are gratefully acknowledged.

PREFACE TO FIFTH EDITION 2020

By Guy De Pauw, President of the European Board of Orthodontics

Digital radiography and digital photography are now commonly used in daily orthodontic practice. In addition, three-dimensional (3D)-imaging is evolving: cone beam computed tomography (CBCT) scanning, 3D-stereophogrammetry, digital models, and 3D-video imaging Development of these new tools are still in progress and it can be expected that new ideas and procedures will occur in the near future.

The EBO has to follow this evolution and should adapt their case presentation procedures to this evolution in an attempt to keep and to improve the actual format of the case presentations.

Therefore, in addition to the conventional presentation of the cases during the EOS congress, it will be possible to submit cases digitally before the examination. The new instructions are included in the EBO application form and the EBO guide.

The support and contributions of Dr Herman Duterloo are gratefully acknowledged.

CHAPTER 1

INTRODUCTION

The purpose of this book is to encourage participation in the EBO examination by providing complete and detailed information about all the requirements, the selection of cases for presentation, the requirements for case presentation records and the oral examination. Information is given on the evaluation of cases by examiners and the marking system.
Additional information is provided in two appendices to the book that can be found separately. Appendix 1 contains all pre-prints and forms to enhance the efficient production of case presentation books and Appendix 2 a list of EBO members and examiners.

This book is prepared to inform orthodontists about the possibilities and requirements to participate in the examination of the EBO. All possible effort has been taken to be as complete as possible. All necessary information on how to prepare for the examination; together with the requirements are presented and, frequently, an explanation is provided as to why the requirements are mandatory. Recommendations are given on how to produce the case presentation books efficiently. Special attention and recommendations are given on how to arrive at a good selection of cases. Experience has shown that the time factor involved to collect, select and/or prepare the eight case presentations is sometimes underestimated.
Requirements concerning the quality of records are presented in detail together with useful recommendations on how to obtain and present high quality records.

CHAPTER 2

ORIGIN OF THE EUROPEAN BOARD OF ORTHODONTICS

2.1 BACKGROUND INFORMATION *

In the western world orthodontic treatment was available on a very limited scale in the first part of the last century, and then only to a select part of the population. During the second half of that century orthodontics developed into a thriving branch of the health industry and is now provided on a mass scale. The number of orthodontists and the amount of orthodontic treatment provided has grown immensely.

Originally issues to monitor and improve the quality of care came to the fore. Latterly and certainly over the past decade or so, self-audit, clinical governance, and peer review have become major issues in all branches of the health industry. Fundamental to these issues is the assessment of quality by peer review.

In orthodontics several systems have developed and have been adapted for specific purposes. On a population scale, where statistical procedures are essential, standards and indices were designed and applied to measure quality. In the last decade the need, effectiveness and efficiency of orthodontic treatment provided by various groups of care providers became a popular field of research (Shaw *et al*., 1991; Richmond *et al.,* 1994; Prahl-Andersen, 1998; Al Yami *et al*., 1999; McMullan *et al*., 2003).

Recently, in the Netherlands, structured, systematic visitation of orthodontic practices by peers has been implemented, but as yet does not include evaluation of treatment.

Certification by Board examination is another way of promoting high standards of care. The aim is to improve the professional performance of the individual clinician by careful and extensive evaluation of all aspects of actual patient treatments.

In the United States of America (USA) such a system was formulated in 1929 when the American Board of Orthodontics (ABO) was set up. The ABO introduced a voluntary examination and standards of excellence were gradually established by consensus of the chosen experts of the day. There are to date more than 5000 ABO certified orthodontists. To be a diplomat of the ABO became an important career asset for academics and leading clinicians in the USA (Vaden and Kokich, 2000). James Vaden, past President of the ABO,

listed the following reasons for putting oneself forward for Board examinations (Vaden, 2000):

- Personal growth as a practising clinician
- Increased self confidence
- An invaluable learning experience
- Improved standards of practice
- Establishes standards and parameters for the profession

In Europe, the development of orthodontic specialties was rather more haphazard throughout the 20th century. Although orthodontics is now recognised as a specialty of dentistry in most countries of Western Europe, large differences still exist between the various public health systems in these countries. This has had a major impact on the way orthodontics is provided and practised, and on what portion of the population has access to the service.

Orthodontic specialist education, mostly at academic institutions (NEBEOP), is provided in most European countries. A standard curriculum (The Erasmus Programme; Van der Linden *et al.*, 1992) was designed and has been adopted by many European universities. An update of the Erasmus programme was made in 2014 (The Erasmus programme for postgraduate education in orthodontics in Europe: an update of the guidelines. Huggare *et al.*, 2014). In view of the developments indicated above, the EOS, in 1996, initiated the EBO.

*From: Sandler P J, Duterloo H S 2003 European Board of Orthodontics- a professional challenge. Journal of Orthodontics 30: 59-71. With permission.

2.2 OBJECTIVES OF THE EUROPEAN BOARD OF ORTHODONTICS

The objectives of the EBO are described in the Articles of Association of the EOS (Table 1).

To enhance the standards of orthodontic treatment throughout Europe by providing a standard against which the orthodontists who so desire can be judged independently of national examinations and barriers. *The EBO would encourage the spirit of self-improvement among colleagues who are recognised specialists in orthodontics within countries in Europe.* *The standards of orthodontic treatment would be judged by an expert panel of European orthodontists nominated by the Council of the European Orthodontic Society (The Examination Board).*

Table 1 Extract from the Articles of Association of the EOS; adopted June 5th 2000

The first Examination Committee was nominated in 1997 and its task was to set the standards, organise and execute the examinations. Since the first examination in 1997, at the EOS Congress in Valencia, a growing number of clinicians have been awarded Board membership and received the certificate of excellence (see Appendix 2). During this time national boards have also been set up. Though many similarities exist, all the examinations (American, European, Italian, French etc.) differ in various aspects as regards content, requirements, organisation and judgement systems (Duterloo and Sandler, 2004). The European Board is different from the other boards in the sense that it is an ***international board*** that acts independently of national barriers.

2.3 MEMBERSHIP CATEGORIES

The European Board of Orthodontics has three membership categories:

FULL MEMBERSHIP

Certification as a Member of the European Board of Orthodontics is awarded when clinical excellence is identified after demonstration of the required number of treated cases and performance with two unseen clinical cases.

PROVISIONAL MEMBERSHIP

For Provisional Membership part of the requirements for membership of the European Board of Orthodontics shall be fulfilled. This membership category is open for recently graduated orthodontists, who in further consequence may qualify as Full Member within a given number of years.

HONORARY MEMBERSHIP

Honorary Membership may be conferred to individuals deemed worthy of such honour because they have made major contributions to the formation, concept, purpose or perpetuation of the European Board of Orthodontics.

2.4 References

Al Yami E A, Kuijpers-Jagtman A M, van ‘t Hof M A 1999 Stability of orthodontic treatment outcome: follow-up until 10 years postretention. American Journal of Orthodontics and Dentofacial Orthopedics 115: 300-304

Duterloo H S, Sandler P J 2004 A comparison of current orthodontic board examinations. Journal of Orthodontics 31: 98-104

Fischer K, von Konow L Brattström V 2000 Open bite: stability after bimaxillary surgery—2-year treatment outcomes in 58 patients. European Journal of Orthodontics 22: 711-718

Huggare J *et al*. 2014 The Erasmus programme for postgraduate education in orthodontics in Europe: an update of the guidelines. European Journal of Orthodontics 36: 340-349

McMullan R E, *et al*. 2003 Development of a treatment outcome standard as a result of a clinical audit of the outcome of fixed appliance therapy undertaken by hospital-based consultant orthodontists in the UK. British Dental Journal 194: 81-84

Richmond S *et al. 1994* An introduction to occlusal indices. Mandent Press, 2nd Edition

Prahl-Andersen B 1998 Quality development in the orthodontic practice. In: Carels C, Willems G (eds) The future of orthodontics. Leuven University Press, Belgium

Sandler P J , Duterloo H S 2003 European Board of Orthodontists: a professional challenge. Journal of Orthodontics 30: 59-71

Shaw W C, Richmond S, Brook P, Stephens C D 1991 Quality control in orthodontics: indices of treatment need and treatment standards. British Dental Journal 170: 107-112

Vaden J L, Kokich V G 2000 The American Board of Orthodontics. Past, Present, and Future. American Journal of Orthodontics and Dentofacacial Orthopedics 117: 530-532

Vaden J L 2000 The American Board of Orthodontics AJODO Gazette 2000

Van der Linden F P G M 1992 Three years postgraduate programme in orthodontics. The final report of the Erasmus project. European Journal of Orthodontics 14: 85-94

CHAPTER 3

GENERAL INFORMATION ON THE EXAMINATION

3.1 APPLICATIONS

Applications must be received at the EOS office before the 31 January of the year you want to take the examination.

Examinations are held on the two or three days just prior to the Annual Congress of the EOS, so please check the dates of the congress.

After your application you will, in due course, receive precise instructions from the EOS office.

It is wise to start early with selecting cases for the presentation and plan the year in which you want to take the examination.

It is also wise to select more than one case for each category, if they are available. However, as described in the rules you may substitute only one case as a replacement and you should inform the EOS and explain why you took this option.

As an example: an acceptable replacement could be if the clinician does not treat adults because he/she works in a child clinic and work conditions do not allow adult treatment.

3.2 HOW TO APPLY?

Write, e-mail, fax or telephone the EOS Office

European Orthodontic Society

Flat 20, 49 Hallam Street, London W1W 6JN England

Telephone No: +44 (0) 20 7637 0367; Fax No: +44 (0) 20 7323 0410
e-mail: membership@eoseurope.org

You will then receive the APPLICATION FORM and/or all necessary other information.

3.3 FEE AND PAYMENT

After contacting the EOS Office in London you will receive the APPLICATION FORM FOR MEMBERSHIP OF THE EUROPEAN BOARD OF ORTHODONTICS. Alternatively, this form may be downloaded from the EOS-website (www.eoseurope.org).

This form contains information about the amount and payment of the examination fee.

The examination fee, as applicable, must have been paid before the date of the examination.

Payment can be made using Visa/MasterCard/Eurocard or a Sterling cheque drawn on a British bank made payable to the "European Orthodontic Society".
If a candidate withdraws from the examination less than three months before the date of the examination a portion of the fee will be forfeited. All such withdrawals should be in writing.

3.4 ELIGIBILITY AND QUALIFICATIONS

ELIGIBILITY FULL MEMBERSHIP

The candidate presenting for the EBO must fulfil the following educational and professional requirements:

1. The candidate must have undertaken a period of full-time training in orthodontics of at least three years duration or its equivalent, approved by the National Specialist Committee in orthodontics or the appropriate body in the country in which the orthodontist resides. Alternatively, two years full-time orthodontic education or its equivalent and at least two years of full-time teaching in orthodontics at the university is accepted. The requirements should not exclude well-trained orthodontic specialists from countries without a specialist register (e.g. Austria, Spain).

2. Candidates from countries without a specialist register must have passed the national Board examination or have a comparable qualification.

3. The candidate must have been an independent specialist practitioner for 5 years.

4. The candidate shall confirm that the cases presented pursuant to these regulations have been diagnosed and treated by and under the sole responsibility of the candidate and that all such cases were diagnosed and treated after he/she had satisfied the training period required by regulation 1.

5. For every case presented, it is essential to include an informed consent signed by the patient or his/her parent/care keeper indicating that the patient has been treated by a certain orthodontist and granting permission to show his/her data in a digital format for the case study. Furthermore each case should have a form signed by the presenter confirming that images have not been manipulated

6. The examination fee as applicable must have been paid before the date of the examination. If a candidate withdraws from the examination less than 3 months before the date of the examination a portion of the fee paid will be forfeited. All such withdrawals must be in writing.

7. Together with the application the candidate shall submit to the EBO a **complete professional *curriculum vitae*** since obtaining the first registered dental qualification and provide evidence of his/her orthodontic training, the acceptability of which shall be considered

by the President of the EBO.

ELIGIBILITY PROVISIONAL MEMBERSHIP

The candidate for provisional membership presenting for the EBO must fulfil the following educational and professional requirements:

1. The candidate must have undertaken a period of full-time training in orthodontics of at least three years duration or its equivalent, approved by the National Specialist Committee in orthodontics or the appropriate body in the country in which the candidate resides. Alternatively, two years full-time orthodontic education or its equivalent and at least one year of full-time teaching in orthodontics at the university is accepted. The requirements should not exclude well-trained orthodontic specialists from countries without a specialist register (e.g. Austria, Spain).

2. The candidate must apply for provisional membership within 24 months after finishing his / her postgraduate training in orthodontics.

3. The candidate shall confirm that the cases presented pursuant to these regulations have been completely diagnosed, completely planned and completely treated by the candidate under surveillance during the period of orthodontic training. Evidence of the above must be provided in the case presentation.

4. For every case presented, it is essential to include an informed consent signed by the patient or his/her parent/care keeper indicating that the patient has been treated by a certain orthodontist and granting permission to show his/her data in a digital format for the case study. Furthermore each case should have a form signed by the presenter confirming that images have not been manipulated.

5. The candidate's statement must be accompanied by a confirmation signed by the chairperson of the applicable orthodontic department on university letterhead stating that the 2 cases presented for Provisional Membership were completely diagnosed, completely planned and completely treated by the candidate under surveillance during the period of orthodontic training.

6. The examination fee as applicable must have been paid before the date of the examination. If a candidate withdraws from the examination less than 3 months before the date of the examination a portion of the fee paid will be forfeited. All such withdrawals must be in writing.

7. Together with the application the candidate shall submit to the EBO a **complete professional *curriculum vitae*** since obtaining the first registered dental qualification and provide evidence of his/her orthodontic training, the acceptability of which shall be considered by the President of the European Board of Orthodontics.

Comment: it is clear from these regulations that case presentations from patients treated in a group practice or orthodontic department by more than one clinician are not acceptable. It is also clear that application for the examination by a group practice or institution is not acceptable.

3.5 DESCRIPTION OF GENERAL PROCEDURE FULL MEMBERSHIP

The examination shall consist of:

1. The presentation of the number of cases required covering a spectrum of malocclusions as specified. Marks will be allotted for the complexity of the cases, the excellence of the treatment results and the presentation.

2. In addition to the conventional presentation of the cases during the EOS congress, it will be possible to submit cases digitally before the examination. The standardised case presentation format (pages of case description) MUST be followed. The case files can be presented as word-files or pdf-files. In case you submit the cases digitally, you will be invited to upload your data with a link. During secure file transfer, through the use of PC tools, scripts, and managed file transfer options, files get encrypted when in transit and during storage.

3. The oral examination will focus on the candidate's knowledge, understanding, ability to carry out orthodontic treatment to a high standard, and to understand the theoretical principles underlying the treatment. The language shall be English. The candidate has the right to use an interpreter at his/her expense.

4. When a candidate is deferred, the Examination Committee will advise the candidate on re-examination. A deferred candidate for full membership has the opportunity to re-sit the examination on two separate occasions.

3.5 a DESCRIPTION OF GENERAL PROCEDURE PROVISIONAL MEMBERSHIP

The examination shall consist of:

1. The presentation of the number of cases required covering a spectrum of malocclusions as specified. Marks will be allotted for the complexity of the cases, the excellence of the treatment results and the presentation.

2. For provisional membership two cases treated by the candidate during the period of orthodontic training shall be presented. Retention / postretention records are not mandatory. The active treatment of the cases must be completely finished; all permanent teeth, with exception of the third molars, should have emerged and be in full occlusion.

3. In addition to the conventional presentation of the cases during the EOS congress, it will be possible to submit cases digitally before the examination. The standardised case presentation format (pages of case description) MUST be followed. The case files can be presented as word-files or pdf-files. In case you submit the cases digitally, you will be invited to upload your data with a link. During secure file transfer, through the use of PC tools, scripts, and managed file

transfer options, files get encrypted when in transit and during storage.

4. The oral examination will be held on the same occasion and will focus on the candidate's knowledge, understanding and ability to carry out orthodontic treatment to a high standard, and to understand the theoretical principles underlying the treatment. The language shall be English. The candidate has the right to use an interpreter at his/her expense.

5. When a candidate is deferred, the Examination Committee will advise the candidate on re-examination. The candidate for provisional membership can only re-sit the examination once. In case of renewed deferral the candidate has the chance to qualify for membership according to the guidelines for full membership.

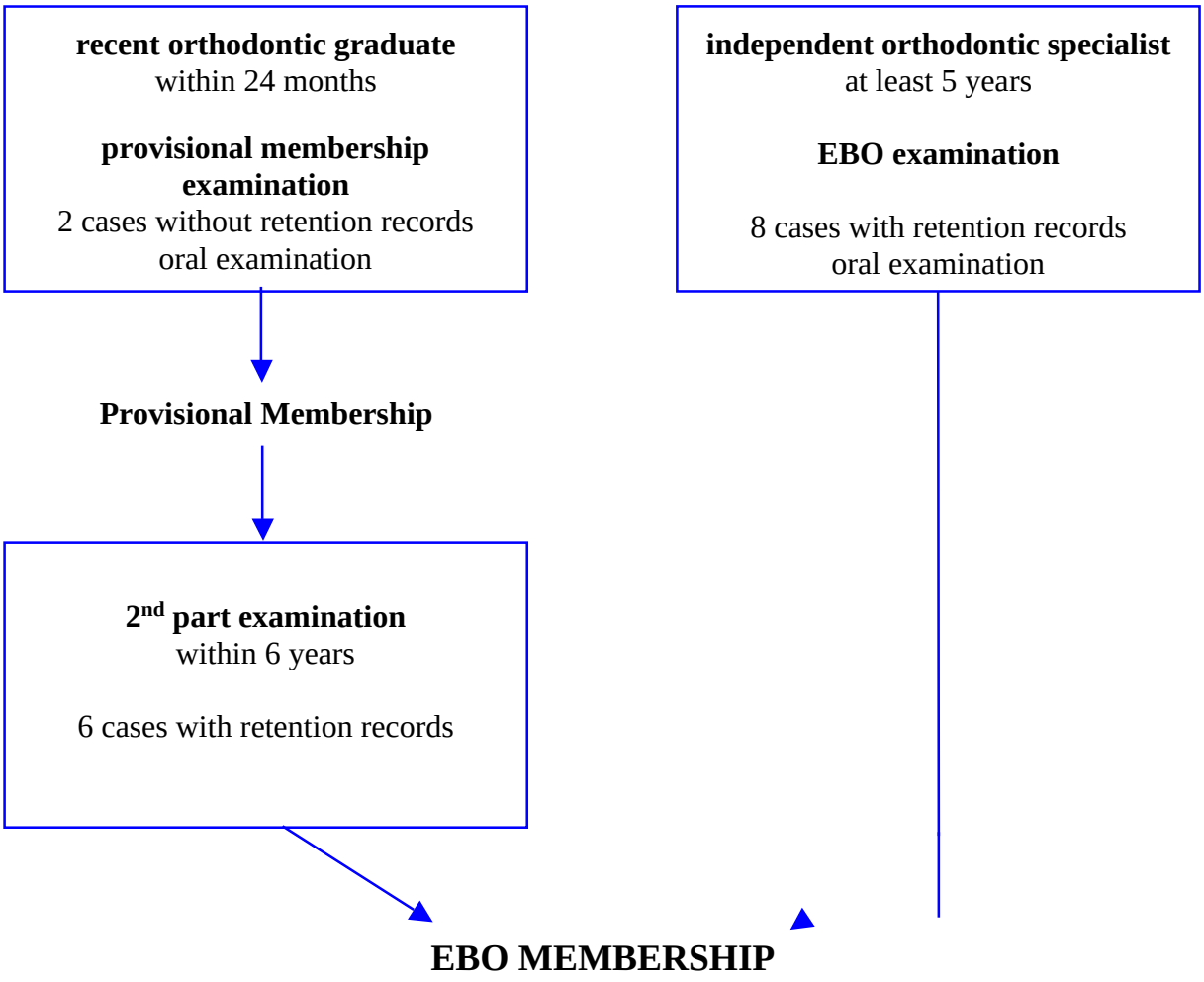
6. Provisional membership is conferred to the candidate who has been successful in the oral examination and who has presented 2 cases that were accepted. Provisional membership

automatically ends after 6 years. At the end of that period the provisional member will be notified that his membership has ended.

7. If the provisional member applies for membership within the period mentioned in 3.5a.5 he/she will receive the "applicant for full membership" status.

8. To qualify for applicant for full membership the provisional member must present another 6 cases, including retention / postretention records, within 6 years after acquiring provisional membership. The applicant shall confirm that the 6 cases presented have been diagnosed and treated by and under the sole responsibility of the candidate and that all such cases were diagnosed and treated after he/she had satisfied the training period required by regulation 3.4.1. These 6 cases should complete the required malocclusion types as specified.

SUMMARY
PATHWAYS TO EBO MEMBERSHIP



3.6 ANONYMITY

To be as objective as possible each candidate is given a candidate number.

After application, they receive their candidate number.

Their identity is kept secret and is only known to the President of the EBO, who received the applications.

All case presentations have to be made fully anonymous, which means that the name and/or address or university or office of the candidate has been removed from each item and/or page of all case presentation books and all dental casts.

At the oral examination, the examiners learn the names of candidates, but these examiners have not examined the case presentations of that candidate and are unaware of the result of that part of the examination. The identity of candidates is only revealed at the end of the final adjudication meeting when the decision as to who is accepted and/or is deferred has been taken.

The candidate will be notified of the date, time and place of the examination by the President of the Board and will lay out the models and case presentation folders at a required time before the examination. The President of the Board ensures that all the mandatory records are present and if not the cases are “incomplete” and no cases are examined.

If the records are complete then the examiners examine the cases and the oral examination takes place later.

3.7 TYPES OF CASES

1. EARLY TREATMENT MALOCCLUSION

Either a one or two stage treatment started in the primary or mixed dentition and completed in the permanent dentition. Initial records (A) taken prior to the start of phase one are required. If treatment is in two stages, (B) interim records are required following the completion of stage one or prior to the start of stage two. The final records (C) must be taken within one year after the end of treatment.

2. ADULT MALOCCLUSION

An adult malocclusion not requiring orthognathic surgery but requiring comprehensive therapy and significant diagnostic and biomechanical skills, which may also include interdisciplinary co-operation.

3. CLASS I MALOCCLUSION

A malocclusion with either a dento-alveolar protrusion, open bite, deep overbite or a significant arch length deficiency, or eruption problem requiring orthodontic treatment.

4. CLASS II DIVISION 2 MALOCCLUSION

Exhibiting an anterior deep overbite with at least two retroclined incisors and a Class II canine relationship.

5. CLASS II DIVISION 1 MALOCCLUSION

A malocclusion with a high Frankfort mandibular plane angle, minimum FM angle of 30 degrees and/or SN to Go-Gn angle of 37 degrees.

6. CLASS II DIVISION 1 MALOCCLUSION

A malocclusion with a significant mandibular arch length deficiency. In at least one of the two Class II division 1 cases the treatment must involve extractions in both dental arches.

7. A SEVERE SKELETAL DISCREPANCY

A malocclusion with a severe antero-posterior and/or vertical discrepancy including comprehensive orthodontic therapy.

8. A SIGNIFICANT TRANSVERSE DISCREPANCY

A posterior cross bite that requires full appliance treatment.

SEE ALSO THE ADDITIONAL INFORMATION

ON THE NEXT PAGE (page 24)

3.8 ADDITIONAL INFORMATION TO THE LIST OF TYPES OF CASES

Effective from 2009 additional clarifications are introduced.

In only one case should **orthognathic surgery or extensive restorative treatment** be part of the treatment performed. That treatment should require considerable orthodontics and demonstrate excellent control of biomechanics.

Recommendation: Read and analyse the text of the above descriptions very carefully so that it is absolutely clear to you what types of cases are required. If you select a case to be prepared for presentation check carefully if it fits into that particular category.

Note also that only **for case 2 the requirement "adult"** is made. This implies that in the other cases (with the obvious exception of case 1) one may use an adult, child or adolescent case. Within the context of these requirements "adult" means where somatic growth has ceased and does not play a role within the treatment plan or its evaluation.

Replacement Case. If a candidate is unable to produce a case that fits **one of the categories** they may substitute another case from another category **but must give a logical explanation as to why it has been substituted and may only do this for one case**. The President of the EBO must be informed at least four weeks prior to the examination in written form.

The **early treatment case** must be started in the mixed dentition. Usually, such treatment is undertaken in two stages. The documentation should include records at the end of stage I or prior to starting stage II. Preferably, an intermediate full set of records as described in the guidelines is presented. If treatment is performed in one stage clear reasons must be given.

Note the description of case 4. The requirements state that an anterior deep overbite, at least two retroclined incisors and a Class II canine relationship are required, but not a Class II molar relationship! So a suitable case may have either a Class I or a Class II molar relationship. Both are acceptable. The Class II canine relationship must be at least a full Class II; i.e. the cusp of the lower canine has to be perpendicular to the interproximal space of the upper first premolar and the upper canine, or the cusp of the upper canine has to be perpendicular or even more mesial to the most mesial point of the lower canine. A bilateral cusp-to-cusp relationship will not be accepted. It will be accepted, however, if one side has a full Class II canine relationship, whereas the other side is not more towards Class I relationship than cusp-to-cusp.

Also note the requirement in case 6 where it is stated that at least either in case 5 or case 6 treatment must involve extractions in both arches.

In the Class II division 1 malocclusion (categories 5 and 6) the first molars have to be in a full Class II relationship or more, i.e. the mesio-buccal cusp of the upper first molar is perpendicular to the mesial interproximal anatomic contact point of the lower first molar. A bilateral cusp-to-cusp relationship will not be accepted. It will be accepted, however, if one side has a full Class II molar relationship, whereas the other side is not more towards Class I relationship than cusp-to-cusp.

To arrive at the best selection of cases takes time. It is recommended to start with selecting several cases for each category before you actually apply and then select again at a later phase. This prevents you running into time problems. The preparation of the case presentation books also takes time: about 12–15 hours per case. More details are discussed in Chapter 4.

3.9 ORAL EXAMINATION

Effective from 2009, the language for the oral examination shall be English

Following the examination of the case presentations a different team of examiners will present to the candidate two cases for diagnosis and treatment planning. These cases will have anamnestic information, data on the functional status, upper and lower dental casts, photographs, radiographs, a tracing of the lateral skull radiograph and a cephalometric morphological assessment as used in the EBO case presentation.

The candidate will examine the cases for 60 minutes and then the candidate will be examined for 15 minutes on each case.

There is no objection to bringing your own measuring gauges, or paper forms or laptop computer you are familiar with to use for case analysis. Realise however that you have only 30 minutes per case. Contact with the outside world is not allowed during the preparation of the cases. In case the candidate wishes, he/she has the right to use an interpreter at his/her own expense during the interview.

3.10 THE RESULT OF THE EXAMINATION

The result of the examination could be “accepted”, “incomplete” or “deferred”.

“Accepted”:

If a candidate is accepted their name will be proposed to the Council of the EOS, and then to the Business Meeting of the Society, who then nominates them to Member of the EBO.

A Certificate signed by the President of the EOS and the members of the Examination Committee, and the EBO badge will presented to the candidate.

For EBO Members the following regulations also exist:

1. In cases of ethical misconduct or a Member acting unprofessionally, Membership may be revoked by and at the absolute discretion of the Council of the EOS.

2. The use of the designation “Member of the European Board of Orthodontics” (in English or in the national language) on cards, letterheads, directories and announcements can be used only if so permitted by national laws and regulations.

3. Membership of the EBO would not grant the right of practice in any country but would indicate that the orthodontist has demonstrated a clinical standard of excellence.

“Incomplete”:

The status “incomplete” refers to the situation where in the candidate’s case presentations, any mandatory material is unavailable and/or where the candidate is unable to pursue the oral examination. In case of any missing mandatory material none of the other cases are judged and further examination is postponed.

“Deferred”:

The status “deferred” means that the candidate has not fulfilled the requirements for the case presentation and/or oral examination and has not demonstrated the standard required. When a candidate is deferred, the Examination Committee will advise the candidate on re- examination. The candidate for provisional membership can re-sit the examination once. The candidate for full membership can only re-sit the examination twice (so in total a candidate has the opportunity to take the examination only 3 times).

The Examination Committee advises the time interval between the examinations, the case presentations and the oral examination.

3.11 ANNOUNCEMENT OF THE RESULT OF THE EXAMINATION

The Chairman of the Examination Committee and the President of the EBO will inform all candidates of the result of the examination immediately following the final adjudication meeting of the examiners. The names of the successful candidates are presented to the Council and then to the Business Meeting of the Society.

Membership of the European Board of Orthodontics shall be granted to candidates who have demonstrated a theoretical and clinical standard which is in accordance with the requirements of the Board, but this would not grant the right of practice in any country.

3.12 CASE EXHIBITION

Successful candidates may be asked to exhibit their cases at the EOS Congress.

Special arrangements and announcements of the EBO exhibition will be made in the announcements of the Congress. Space and security will be provided. Be prepared that visitors might like to discuss case reports with you.

The Examination Committee selects from the successful candidates those presentations that are most appropriate and explicitly demonstrate the standards of the Board.

Every orthodontist is of course welcome at the exhibition!
If you consider applying for the Board Examination in the future, a visit to the exhibition is strongly recommended so that you are aware of the standards of the Board.

3.13 PUBLICATION OF ACCEPTED CASES

May I use presented and accepted cases for publication and mention that the EBO accepted the case?

The Board promotes the publication of excellently treated and presented cases as case reports or otherwise, provided you are a member of the Board. All orthodontists who wish to do so can take advantage of the experience gained from the cases. Such cases, better than anything else, may demonstrate the standards of the Board.
If you want to indicate in the publication that the EBO Examination Committee accepted the case you must write to the Board and ask permission.

The address is:
European Orthodontic Society
Flat 20, 49 Hallam Street, London W1W 6JN, UK
Tel.: +44 (0) 20 7637 0367 Fax: 44 (0) 20 7323 0410
e-mail: membership@eoseurope.org

CHAPTER 4

THE CASE PRESENTATION

4.1 GENERAL SET-UP OF CASE PRESENTATIONS

In order to examine a large number of cases fairly and accurately, it is important that case presentations are standardised as this helps the work of the Examination Committee and provides an objective means to compare with the set standards.

In this Chapter detailed instructions and recommendations are given on how to produce the case presentations. The time needed to produce the case presentation binders and the dental casts is estimated at 12-15 hours per case. The use of computers is recommended as it improves the quality of the presentation.

Paper size is A-4. Each page should be placed in a transparent protective cover and the pages placed in a suitable binder or file. Be sure that material cannot fall out of the folder: it might get lost.

Candidates must write all texts in English (pages in the Index of Pages marked by *)

Candidates must limit texts, to the text boxes provided.

The size of the type can be changed, but the spacing should remain constant.

Tracings should be made in the prescribed colours - black, red and green, on transparent material and placed inside the protective covers. White background paper should not be included, as the tracings will be removed for checking and comparison. Each of the cases presented must follow the index of pages. Each page is, unless otherwise stated, mandatory.

It is in the spirit of the EBO that records are as close to the real anatomy, morphology and pathology as possible. Reasonable digital cropping, resizing or rotation is permissible.

PLEASE NOTE that the examination is anonymous. **DO NOT** use any material, print-outs etc. showing the candidate's name; **DO NOT** use the patient's full name, but only the initials.

4.2 CASE PRESENTATION INDEX OF PAGES

Index of pages

Number	Title of page
EBO-01	COVER
EBO-02.1*	RÉSUMÉ OF CASE 1
EBO-02.2*	RÉSUMÉ OF CASE 2
EBO-02.3*	RÉSUMÉ OF CASE 3
EBO-02.4*	RÉSUMÉ OF CASE 4
EBO-02.5*	RÉSUMÉ OF CASE 5
EBO-02.6*	RÉSUMÉ OF CASE 6
EBO-02.7*	RÉSUMÉ OF CASE 7
EBO-02.8*	RÉSUMÉ OF CASE 8
EBO-02.9*	RÉSUMÉ OF CASE 9
EBO-03*	DIAGNOSTIC DESCRIPTION OF THE MALOCCLUSION
EBO-04	FACIAL PHOTOGRAPHS BEFORE TREATMENT
EBO-05	INTRA-ORAL COLOUR PHOTOGRAPHS OF THE OCCLUSION BEFORE TREATMENT
EBO-06	LATERAL SKULL RADIOGRAPH BEFORE TREATMENT
EBO-07	TRACING OF LATERAL SKULL RADIOGRAPH BEFORE TREATMENT
EBO-08	CEPHALOMETRIC MORPHOLOGICAL ASSESSMENT I
EBO-09	PERIAPICAL OR PANORAMIC RADIOGRAPHS BEFORE TREATMENT
EBO-10	ANY OTHER RADIOGRAPHS BEFORE TREATMENT
EBO-11*	RADIOGRAPHIC ANALYSIS BEFORE TREATMENT
EBO-12*	TREATMENT PLAN AND THE REASON FOR IT
EBO-13*	RÉSUMÉ OF THE TREATMENT CARRIED OUT INCLUDING ANY DIFFICULTIES ENCOUNTERED
EBO-14	FACIAL PHOTOGRAPHS AT COMPLETION OF TREATMENT
EBO-15	INTRA-ORAL COLOUR PHOTOGRAPHS OF THE OCCLUSION AT COMPLETION OF TREATMENT
EBO-16	LATERAL SKULL RADIOGRAPH AT OR TOWARDS COMPLETION OF TREATMENT
EBO-17	TRACING OF LATERAL SKULL RADIOGRAPH AT OR TOWARDS COMPLETION OF TREATMENT
EBO-18	CEPHALOMETRIC MORPHOLOGICAL ASSESSMENT II
EBO-19	PERIAPICAL OR PANORAMIC RADIOGRAPHS AT OR TOWARDS COMPLETION OF TREATMENT
EBO-20*	RADIOGRAPHIC ANALYSIS AT OR TOWARDS COMPLETION OF TREATMENT
EBO-21*	DESCRIPTION OF THE TREATMENT RESULT
EBO-22	FACIAL PHOTOGRAPHS AT RETENTION/ POST-RETENTION
EBO-23	INTRA-ORAL COLOUR PHOTOGRAPHS AT RETENTION / POST-RETENTION
EBO-24	LATERAL SKULL RADIOGRAPH AT RETENTION/ POST-RETENTION
EBO-25	TRACING OF LATERAL SKULL RADIOGRAPH AT RETENTION/ POST-RETENTION
EBO-26	CEPHALOMETRIC MORPHOLOGICAL ASSESSMENT III
EBO-27*	DESCRIPTION OF RETENTION/ POST-RETENTION FINDINGS

red: mandatory pages

All records belonging to one stage (before treatment, at completion of treatment or at retention/post retention, respectively) have to be made within a 60-day period, with the exception of the radiographs at completion of treatment. These may be taken within six months before or after completion of treatment. Exceptions to these rules must be fully explained.

Retention / postretention records are NOT mandatory for Provisional Membership.

Superimpositions: if available, superimpositions may be placed following the tracing of the lateral skull radiograph.

Any other records in the case presentation may be presented to illustrate the case and these should be included on subsequent pages. Analyses and methods of superposition should be clearly defined in writing in English. Pages marked with an asterisk (*) contain text boxes for text written in English. See also 44 and 45 (paragraphs 4.16, 4.17) for additional information.

4.3 IDENTIFICATION AND LABELLING MARKS

Each item in the case presentation, including each upper and lower cast, cephalometric tracings, radiographs and photographs must be clearly marked with the following information:
Candidate's number
Case number
The date on which the record was made
The patient's age
Stage of treatment

I. Start of treatment (**BLACK**)
II. Completion of treatment (**RED**)
III. Follow up records at least one year after completion of treatment (**GREEN**)

If you present **intermediate records**, such as in the early treatment case or a surgical case the colour code is **BLUE**

All case presentations have to be made fully anonymous, which means that the name and/or address, university or office of the candidate has been removed or masked from each item and/or page of all case presentation books.

All cases should give clear evidence of the ability of the candidate to:

1. Formulate an exact and complete orthodontic diagnosis and treatment plan, including the reasons for it;
2. Make correct, weighted clinical judgement in difficult orthodontic situations;
3. Handle the biomechanics of complicated orthodontic conditions;
4. Write a fair and correct evaluation of the treatment provided and its prospects.

The candidate will be asked to put out the models and records required before the examination and the records will be examined in order to ascertain that all mandatory records are

presented. A photographic record of each of the cases will be taken and preserved by the Board.

4.4 INCOMPLETE RECORDS

If any case has inadequate (mandatory) records the examiners will examine none of the cases and the designated result would be " incomplete". Under these circumstances the candidate will be able to present the cases, including all the necessary records at the next meeting of the Examination Committee without payment of a further fee.

4.5 THE SYNOPSIS

What is the synopsis? What to fill in? What is its purpose?

The synopsis is a form to be filled in by the candidate summarising the essential data of each category of the eight cases. It gives an easy overview for the examiners to check if all necessary cases are present. The synopsis is saved as a record of the examination. Two completed copies of the synopsis need to be present. An example of the synopsis is seen on the next page. Appendix 1 contains synopsis forms.

SYNOPSIS OF CASE REPORTS

CANDIDATE NUMBER:

CATEGORY AND INITIALS	TREATMENT SUMMARY	AGE & DATE A-RECORDS	AGE & DATE B-RECORDS	AGE & DATE C-RECORDS
1.Early treatment malocclusion Initials:				
2.Adult malocclusion Initials:				
3.Class I malocclusion Initials:				
4.Class II division 2 malocclusion* Initials:				
5.Class II division1 malocclusion** Initials:				
6.Class II division1 malocclusion*** Initials:				
7.A severe skeletal discrepancy Initials:				
8.A significant transverse discrepancy Initials:				
9. Replacement Case Initials:				

*The Class II division 2 case should exhibit an anterior deep bite with at least two retroclined incisors and a Class II canine relationship.

** A malocclusion with a high Frankfort mandibular plane angle, minimum FM angle of 30˚ and/or S-N to Go-Gn angle of 37˚.

*** A malocclusion with a significant mandibular arch length deficiency.

Either in case 5 or 6 the treatment **must** involve extractions in both dental arches.

Only one of the 8 cases may be treated by orthodontics/orthognathic surgery or by orthodontics/restorative treatment. That treatment should require considerable orthodontics and demonstrate excellent control of biomechanics.

4.6 THE "CASE RÉSUMÉ" PAGE

The case résumé page is (after the cover-page) page 2 in the case presentation book.
It contains a summary of all pertinent data of the case. This makes it easy for the examiners to check if all requirements regarding timing, extractions etc., are available. It is a quick way to make one familiar with the case, before going into detailed evaluation.
Fill in these forms completely and check carefully if they are compatible with the rest of the information in the case presentation book. Do not leave information incomplete as this leaves questions and is not to your advantage.
The next page shows an example of the résumé page.
Appendix 1 contains one résumé page for each of the 8 types of cases, also for the "replacement case" in case you need to present one.

WHAT SHOULD I FILL IN ON THE CASE RÉSUMÉ PAGE?

Where "DATE" is asked fill in the actual date (dd/mm/yyyy) at which the event occurred.
"AGE" age is filled as number of years and months. Thus: if the child is 10 years and 5 months: 10.5 years.
"TEETH MISSING BEFORE TREATMENT": These are teeth not present in the jaws (on intra-oral examination, casts and radiographs) before treatment. For instance: agenesis 35, 45. Teeth you have extracted in relation to the orthodontic treatment are mentioned under treatment plan.
If retention has not ended, write: continued.
To indicate the type of tooth the FDI Two Digit System is used.

RÉSUMÉ OF CASE 1

CASE CATEGORY:

EARLY TREATMENT MALOCCLUSION

INITIALS	:		
BORN	:		
SEX	:		
PRETREATMENT RECORDS	:	AGE:	DATE:
CLASSIFICATION	:		
TEETH MISSING BEFORE TREATMENT	:		
TREATMENT PLAN	:		
APPLIANCE	:		
TREATMENT STARTED	:	AGE:	DATE:
TREATMENT ENDED	:	AGE:	DATE:
ACTIVE TREATMENT TIME	:		
POSTTREATMENT RECORDS	:	AGE:	DATE:
RETAINERS	:	a) upper: b) lower:	
RETENTION ENDED	:	a) upper: b) lower:	DATE: DATE:
RETENTION TIME	:		
(POST-)RETENTION RECORDS	:	AGE:	DATE:
TIME OUT OF RETENTION	:		

CANDIDATE NUMBER:

4.7 ABOUT THE TEXT BOXES

The text must be in English in the text boxes.
{See pages marked with asterisk (*) in the Case Presentation Index of Pages; pages 26/27].
The text boxes provide limited space for you to fill in with text. The purpose of using text boxes is to encourage the candidate to be short, clear and precise in their statements. It is recommended to carefully check the texts and have them read and edited by someone who is familiar with producing condensed texts in English, as in abstracts or summaries.
Base your description of the malocclusion as much as possible on findings from the records and the examination of the patient. Your treatment plan should be logically based upon these findings.
Do not forget to summarize the goals of your treatment. When describing treatment plans make a distinction between “strategic” and “tactical“ aspects. Strategic aspects are, for instance, if you extract permanent teeth and why. Tactical aspects are planning the types of mechanics. There is an advantage in describing evidence-based clinical decisions. Be critical and avoid illogical reasoning such as: “four premolars were extracted, because this is an extraction case”, “clinical judgement of the existing crowding led to the decision to treat non- extraction”, or questionable statements such as ”the patient was given 3 treatment options… to choose from”; the patient selected option…”
Be realistic about the description of the treatment result. If there are details where one could have improved if circumstances where better or where there is need for future surveillance for other reasons, be open. Do not let the examiners guess if you have noticed such details or not.
On page EBO-13 (A Résumé of the actual treatment carried out, including any difficulties encountered) list the treatment sessions with the actual dates and brief indication what was undertaken, the progress, etc. Describe specific events and findings, etc.

NOMENCLATURE: It is to your advantage use correct nomenclature in the descriptions. The use of an orthodontic dictionary is recommended. To name teeth use the FDI Two Digit System.
Reference: Daskalogiannakis J. Glossary of Orthodontic Terms
Quintessence Publishing Co Ltd, New Malden Surrey
UK Price £65; ISBN: 3-87652-760-0

4.8 DENTAL TOMOGRAM/PANORAMIC RADIOGRAPH

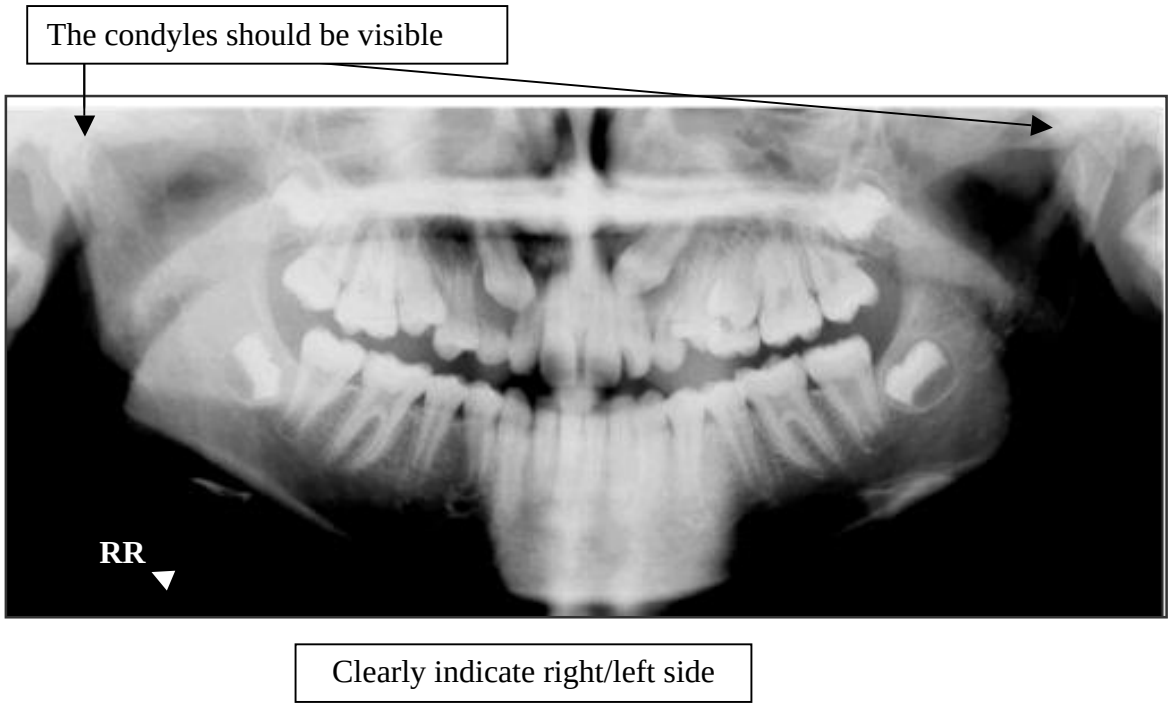
The panoramic radiograph (dental tomogram) is the universally used radiograph for orthodontic patients. However, in many patients with complex dental developmental disturbances and those with skeletal or functional abnormalities, additional radiographs may be necessary, apart from the initial cephalograms. Such radiographs might be essential for a complete understanding the clinical problem at hand and thus need to be included.

Panoramic radiographs should be of sufficient quality to permit interpretation for diagnosis. The literature is replete with articles emphasising the advantages and disadvantages of panoramic radiographs. In addition to this, different types of machines produce different images each with specific characteristics.

Panoramic radiographs are also used for evaluation of possible root position and mesiodistal tooth angulations, third molar position and other conditions towards the end or after treatment. Recent studies indicate that interpretations of mesiodistal root angulations should be performed very carefully and cautiously (McKee *et al.*, 2001).

4.8.1 GENERAL RECOMMENDATIONS FOR PANORAMIC RADIOGRAPHS

Patient position is extremely important to obtain a useful panoramic radiograph. When the occlusal plane is approximately 7 degrees anterior downwards to the horizontal a slightly curved image results. In this way the double images of the palatal vault and the nasal floor are usually above the apices of maxillary teeth.

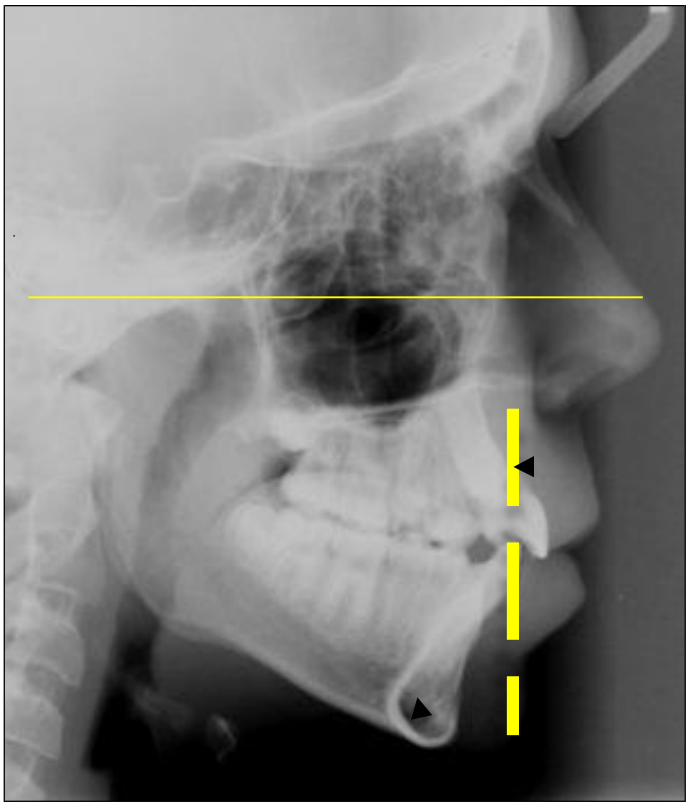


Thus in extreme cases, where the occlusal plane makes a larger than normal angle to the nasal floor, the head of the patient is positioned upward so that the angle of the occlusal plane approaches 7 degrees. However, in subjects with a severe mandibular backward position, even when the patient is asked to move the mandible forward it may not be possible to obtain an image of the lower jaw and teeth without considerable distortion. This is due to the position of the image layer of the machine and the oblique position of the (lower) anterior teeth.

The teeth appear twisted with blunted apices. The coronal part is within the range of the image layer with relatively little enlargement. The apical parts of the roots, however, are positioned backward and more or less outside the range of the image layer so that this part of the image is transversally enlarged. Similarly, the coronal part of a palatally impacted maxillary canine is imaged larger, because of its backward position relative to the image layer. In deep bite cases, have the patient bite either on a bitefork provided with the machine or a cotton role, so that the anterior teeth are not imaged in overlap.

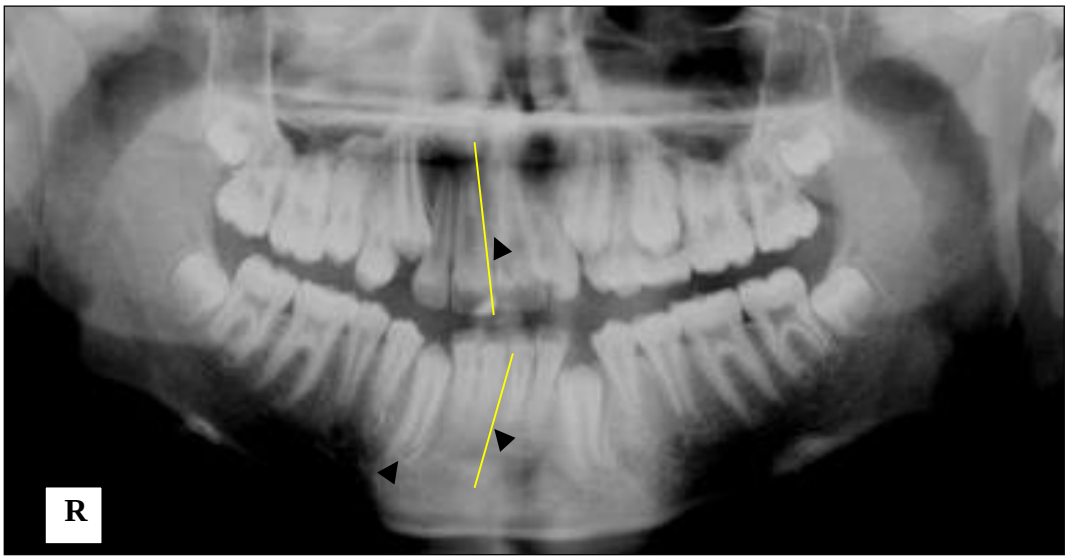
The patient's head should also be placed as precisely as possible with the midsagittal plane in the same position as the midline of the machine. Some machines have light indicators to find the correct position. Incorrect placement may lead to unacceptable distortions and blurring.

The asymmetrical patient obviously creates a problem; the position of the eyes and/or the bipupillar line might be of help, but distortion and blurring might be unavoidable. Measurements on panoramic radiographs are not so reliable to detect small asymmetries (Türp *et al.*, 1995). However, when a group of morphological indications of (mandibular) asymmetry can be observed it is possible to make correct diagnostic conclusions.



Approximate position of the image layer of the panoramic machine

In the panoramic radiograph the lower (mandibular) part appears increasingly transversally enlarged. Thus, in the radiograph the distance between the apices of the lower canines is much larger than the distances between canine crowns. This is caused by the dorsal position of the chin area relative to the image layer of the panoramic machine. Such distortions are sometimes unavoidable.



The root of 43 appears distorted and the apical area is transversally enlarged.

The patient was incorrectly positioned; the face was rotated to the right around a vertical axis. This distortion is avoidable, depending on the symmetrical position of the dental arch relative to the midsagittal plane.

Under the conditions mentioned above it might not always be necessary to take additional radiographs. It is recommended that the panoramic and cephalogram are first analysed together and then decide if additional radiographs are essential. Usually, conditions in the upper anterior region are reasons for extra radiographs.

Do not crop the radiograph to just the teeth; important or additional information might be lost. For instance: images of the mandibular condyles might indicate a need for additional records. Panoramic radiographs from the same patient (e.g. before and after treatment) produced with different machines can only be compared with extreme caution. The reason is that the shape of the image layer is usually different in various types of machines. Measurements are very unreliable in such situations.

References:

Türp J C, W Vach, JR Strub, K Harbich, KW Alt 1995 Erkennung von mandibulären asymmetrien auf der Panoramaschichtaufnahme Schweiz MZ 105:755-759

McKee I W, Glover K E, Williamson P C, Lam E W, Heo G, Major P W 2001 The effect of vertical and horizontal positioning in panoramic radiography on mesiodistal tooth angulations. The Angle Orthodontist 71: 442-451.

4.9 CONE BEAM CT

Cone Beam Computer Tomography.

CBCT technology brings a source of 3D data in clinical orthodontics. These new 3D images can be used in the presentation of the cases due to the ability to capture the entire anatomy needed for orthodontic treatment planning. CBCT allows the determination of size, shape and volumetric differences in bilateral structures as well as growth changes in 3D. However, there are no universally accepted 3D cephalometric analyses comparable to those which have been developed for 2D and there are no normative values.

4.10 CEPHALOMETRIC RADIOGRAPH

The enlargement can be checked

The soft tissue profile is sharply visible

The patient has the teeth in habitual occlusion

Quality cephalograms are usually produced if one follows the prescriptions provided by the manufacturer of the cephalometer and when the film is developed in a well-maintained development machine or digitally processed. Regularly check the earplugs of the machine to ensure that the patient is correctly positioned. Identical conditions for each cephalogram are a fundamental requirement for diagnosis and evaluation of growth/treatment changes.

Special software programs may include advanced image enhancement tools that can significantly improve the clarity of the radiograph

4.11WHAT SHOULD I EXPLAIN ABOUT RADIOGRAPHS?

Radiographs, such as CBCT, panoramic or dental tomograms, periapicals and cephalograms, are not self-explanatory. This means that relevant findings from these radiographs must be mentioned in the texts on the pages in the case presentation book provided for that purpose (pages 11 and 20). The reason for this is that examiners should have no doubts that you have observed the relevant findings and from where you obtained the items mentioned in the text of your diagnosis, treatment plan or in the description of the treatment result. This makes the evaluation of the cases clear and logical to the examiners and is thus to your advantage. For example, when you mention items seen on the panoramic radiograph do not limit yourself to only the teeth and their immediate structures. There are may be other items visible that are of clinical significance: e.g. is there a difference in the images of the condyles or in the mandibular contours? In the end-of-treatment panoramic radiograph: what about position, developmental stage and prospects of third molars? What was your advice to the patient on the basis of that radiograph?

4.12 CAN I USE MY OWN CEPHALOMETRIC ANALYSIS?

Yes you can! However measurement of cephalograms according to the EBO Morphological Assessment Form is mandatory. Other cephalometric procedures are acceptable, if they are clearly explained. Be aware that examiners might be unfamiliar with the analysis you use. Place that information in the back of the folder in the section “Additional records”.

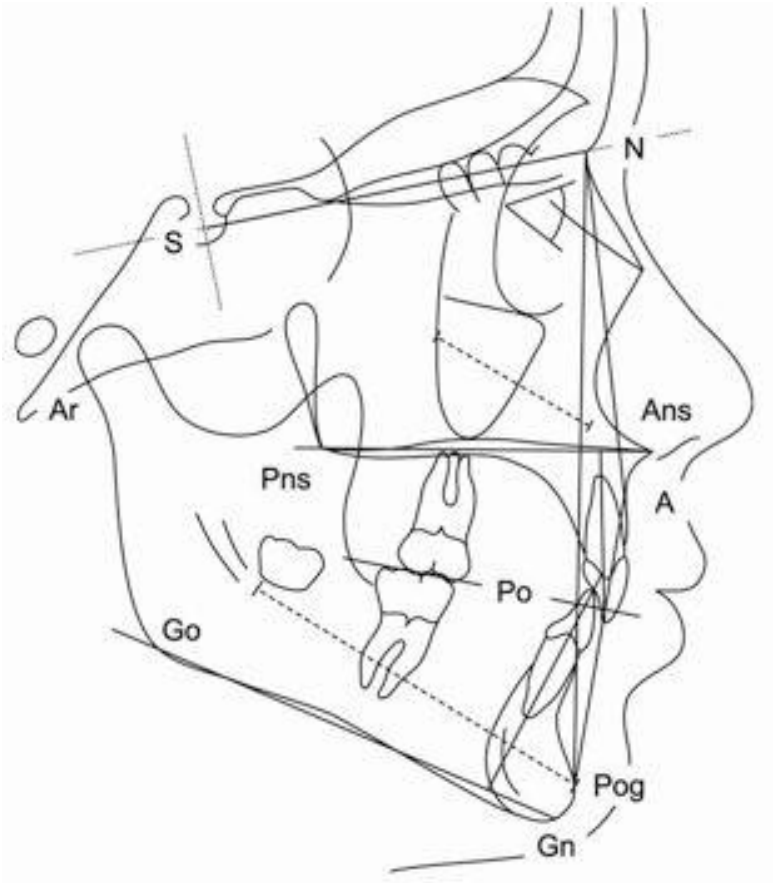
If you want to use your own cephalometric analysis, indicate the additional landmarks as well on the tracing, or include an extra copy of the tracing with the data of your analysis.

4.13 WHAT DO I HAVE TO DO WITH MY MEASUREMENTS?

As is the case with radiographs, the measurements of a cephalometric assessment or analysis are not self-explanatory. It is insufficient to only present the numbers and leave the interpretation to the examiners. The conclusion of your observations and measurements are described in words on the pages provided for that purpose (pages 11 and 20). For example: “on the basis of the cephalometrics it is concluded that the face is retrognathic, but the sagittal jaw relationship is normal”. Or: “the cephalometric data reveal that growth and treatment changes have normalised the sagittal jaw relationship”.

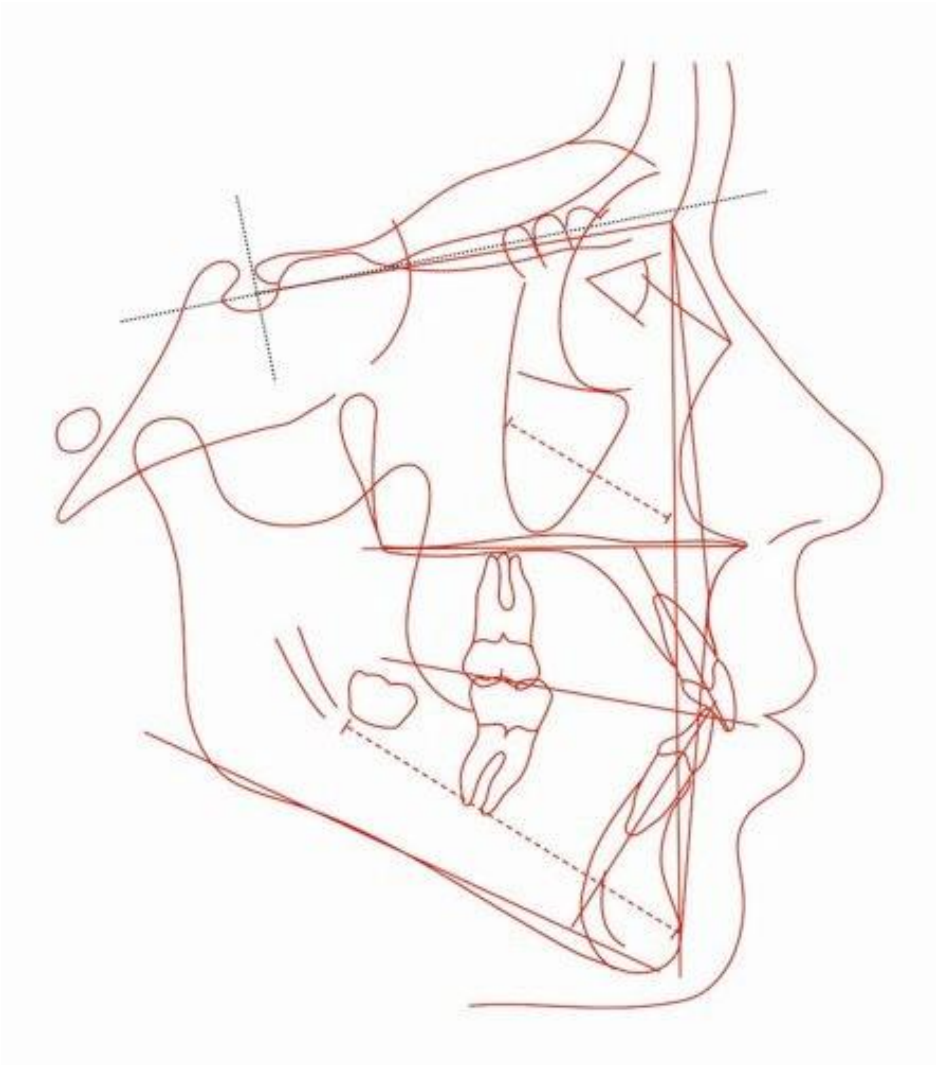
All the above advice is aimed at making the presentation of your diagnosis and treatment plan as clear and logical as possible, based on the described observations and analysis.

4.14 CEPHALOMETRICS: TRACINGS, LANDMARKS, LINES



Example tracing of the before treatment cephalogram (colour: black)

Tracings must be produced using a 0.5 mm lead pencil on thin transparent acetate tracing paper so that the accuracy of the tracing can be checked. Do not use a felt pen: it is usually much too thick. The landmarks used for the EBO Morphological Assessment should be indicated on the tracing. If you also want to use your own cephalometric analysis then indicate the necessary landmarks as well on the tracing. Computerised production of tracings is not acceptable, however computerised preparation and printing of tracings (and superimpositions) is acceptable to enhance presentation. The original must be available for checking the accuracy of the tracing. Place them with the additional material in the back of the folder. Pre-treatment tracing in black (mandatory), post-treatment tracing in red (not mandatory, but desirable, if available). Final records: tracing in green (not mandatory, but desirable, if available)



Example of the end of active treatment tracing in red

Place the tracings in the cover sheets and remove the indicated part of the page, so that it is easy for the examiners to check the tracing and compare with the cephalogram.

When interpreting and describing changes in the measurements you observe be aware of the *error of the method*, before you make definite statements about changes due to growth/treatment when evaluating your case.

Reference:

Kamoen A, Dermaut L, Verbeeck R 2001 The clinical significance of measurement error in the interpretation of treatment results. European Journal of Orthodontics 23: 569-578

CEPHALOMETRIC MORPHOLOGICAL ASSESSMENT I

	Pre-treatment			Mean SD
Sagittal Skeletal Relations				
Maxillary Position S-N-A				82º± 3.5º
Mandibular Position S-N-Pg				80º± 3.5º
Sagittal Jaw Relation A-N-Pg				2º± 2.5º
Vertical Skeletal Relations				
Maxillary Inclination S-N/ANS-PNS				8º± 3.0º
Mandibular Inclination S-N/Go-Gn				33º± 2.5º
Vertical Jaw Relation ANS-PNS/Go-Gn				25º± 6.0º
Dento-Basal Relations				
Maxillary Incisor Inclination $\underline{1}$-ANS-PNS				110º± 6.0º
Mandibular Incisor Inclination $\overline{1}$-Go-Gn				94º± 7.0º
Mandibular Incisor Compensation $\overline{1}$-A-Pg (mm)				2 ± 2.0
Dental Relations				
Overjet (mm)				3.5± 2.5
Overbite (mm)				2 ± 2.5
Interincisal Angle $\underline{1}$/1				132º± 6.0º

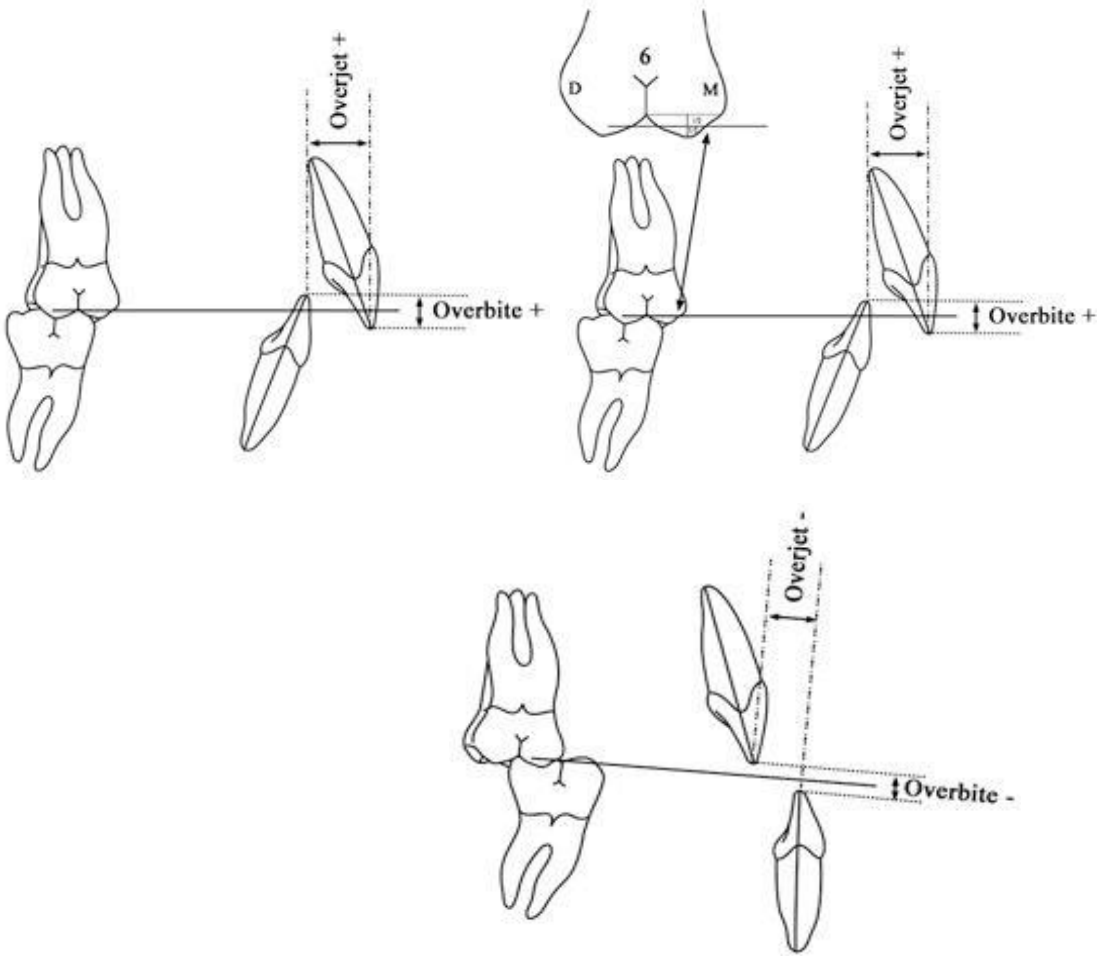
CANDIDATE NUMBER:

CASE NUMBER: DATE: AGE

4.15 EBO CEPHALOMETRIC MORPHOLOGICAL ASSESSMENT

It is mandatory to fill in the forms for the EBO Cephalometric Morphological Assessment (example on page 44). The morphological assessment is not a cephalometric analysis. The reason for including this mandatory form is to make it possible for the examiners to familiarise themselves more easily with the main characteristics of the case and to compare with other cases.

It is perfectly alright if you use your (own) usual cephalometric analysis and you may include that in the additional records, provided that you explain it properly so that it is understandable for anyone who is not familiar with that analysis. Do not forget to indicate landmarks on your tracing.



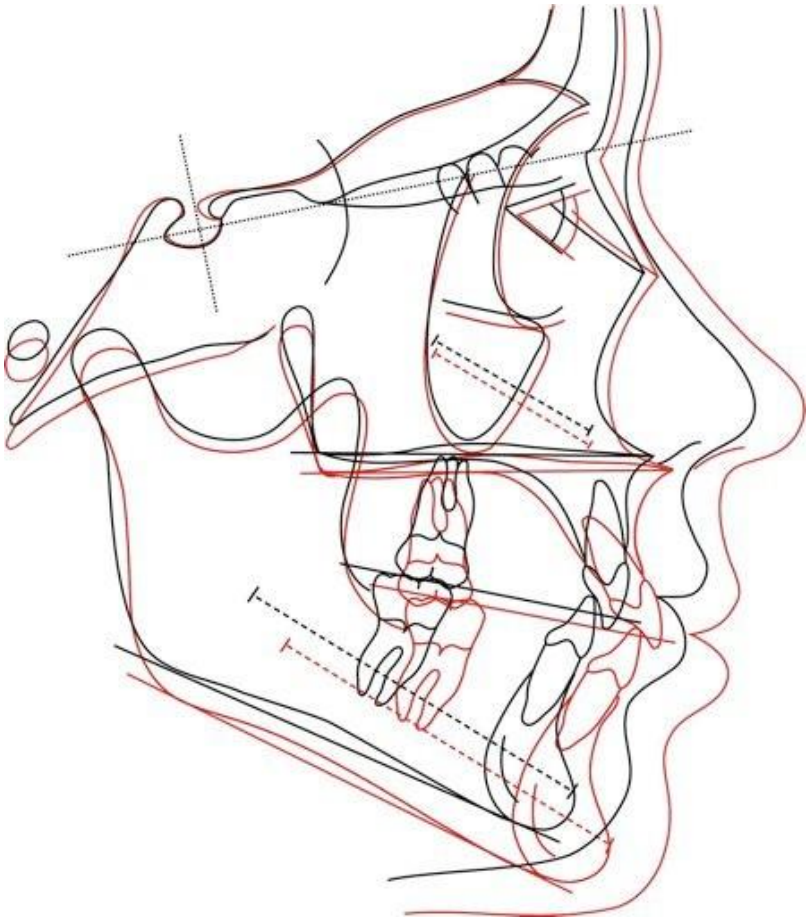
For the EBO Cephalometric Morphological Assessment, overbite and overjet are measured as indicated.

4.16 CEPHALOMETRIC SUPERIMPOSITION

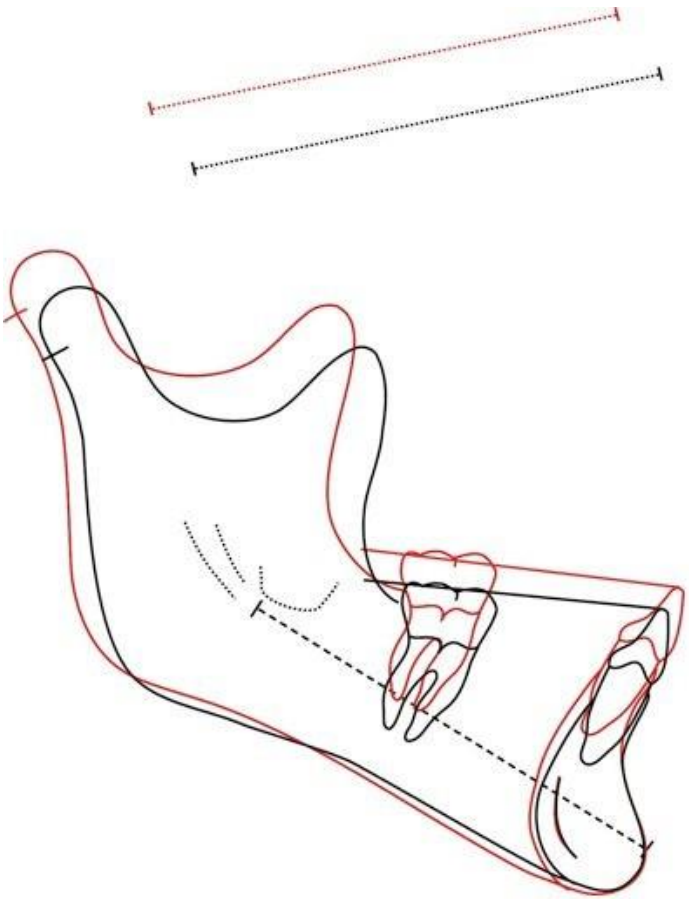
Superimposition of tracings is not mandatory. However if post-treatment radiographs are authorized in your country superimposition may greatly enhance the evaluation of the case. Björk's method (Björk and Skieller, 1983) of superimposition on natural reference structures in the cranial base, the mandible and maxilla is recommended. The illustrations in 4.15.1, 4.15.2 and 4.15.3 are printed here as examples to demonstrate how these superimpositions look.
If you use superimpositions describe also your interpretations and findings.

4.16.1 GENERAL SUPERIMPOSITION

Superimposition on stable structures in the anterior cranial base

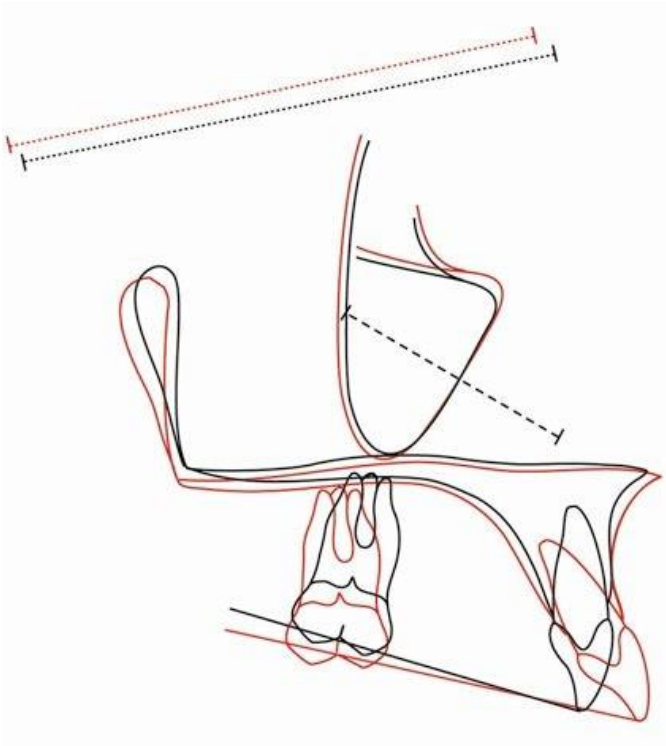


4.16.2 SUPERIMPOSITION OF THE MANDIBLE



Local superimposition on natural reference structures in the mandible

4.16.3 SUPERIMPOSITION OF THE MAXILLA



Local superimposition on natural reference structures in the maxilla

References

Björk A, V Skieller 1972 Facial development and tooth eruption. An implant study at the age of puberty. American Journal of Orthodontics 62: 339-383

Björk A, V Skieller 1976 Postnatal growth and development of the maxillary complex. In: McNamara Jr. J A (ed.) Factors affecting the growth of the midface. Monograph No. 6, Craniofacial Growth Series, Center for Human Growth and Development, University of Michigan, Ann Arbor, pp 61-69

Björk A, V Skieller 1983 Normal and abnormal growth of the mandible. A synthesis of longitudinal cephalometric implant studies over a period of 25 years. European Journal of Orthodontics 5:1-46

Duterloo H S, Planché P G 2011 Handbook of cephalometric superimposition. Quintessence Publishing Co. Inc., Hanover Park. Illinois

4.17 OTHER ADDITIONAL RADIOGRAPHS

In more complicated cases additional radiographs might be necessary for complete diagnosis and treatment planning. Such radiographs should be placed with (A) The records before treatment on page EBO-10 of the Case Presentation Book of that case. Explain on page EBO-11, the need for these records and your interpretation and conclusions.

The routine standard use of posteroanterior or anteroposterior cephalograms and/or hand/wrist radiographs is not recommended. In cases of dental trauma or impacted unerupted teeth peri-apicals and/or other radiographs may be necessary for correct diagnosis and to demonstrate the appropriateness of your treatment decisions. In cases of severe developmental craniofacial deformities other three-dimensional imaging techniques may be needed.

Failure to include such records may impair judgement for the examiners.

4.18 LIMITATIONS IN PATIENT RECORDS

The Board promotes and recommends strict radiation dosage control
(application of the ALARA principle).

In some countries limitations exist in taking radiographs.

They create no particular problem with regard to the requirements for the EBO case presentations.

Regarding post-treatment records, the guidelines of the BOS* are used as an example. These create no problem provided that proper evaluation of the treatment that was proposed is possible. The treatment of complicated and difficult cases often needs records during, towards the end, or even after orthodontics. They are needed to evaluate the treatment effects or as a starting point for other treatments such as prosthetics and/or periodontics or surgery.

*** Reference**

Isaacson K G, Thom A R, Horner K, Whaites E (3rd edition, 2008) Orthodontic radiographs – guidelines. British Orthodontic Society.
http://www.bos.org.uk/publicationslinks/radiographyguidelinespp2.htm

Kapila D, Nervina J M 2015 CBCT in orthodontics: assessments of treatment outcomes and indications for its use. Dentomaxillofacial Radiology 44:20140282

The EBO distinguishes between mandatory records and additional other records.
The EBO has therefore in the form “instructions to candidates” the following statements:
B records (Completion of Treatment),
Page EBO-16: “lateral skull radiograph at the completion of treatment is not mandatory but useful if available”
It is obvious in such condition that EBO-17 (tracing in red) and EBO-18 (Cephalometric Morphological Assessment II) are not mandatory, but useful if available.
Page EBO-19 (Peri-apical or panoramic radiograph at completion of treatment) and page EBO- 20 (Radiographic analysis at completion of treatment) are mandatory.
C records: similar rules.

In addition to the above, examiners always take a close look at “additional records” for better evaluation of the case. For instance, a careful cephalometric evaluation of the growth/treatment effects with additional cephalograms, tracings and superimpositions may greatly enhance the evaluation. The examiners also look to the justification for records, in particular radiographs; for instance the demonstration of a large number of TMJ radiographs when from the described diagnostics nothing indicated that there was a problem to be diagnosed in that way. This, of course, may obviously negatively influence the marks. Though only 10% of the marks are given for record quality, excellent records can considerably improve proper judgement. In short: the candidate has quite some freedom in what to present, but there is a minimum of mandatory records and of course the presentation of the case must be such that it can be properly evaluated. Additional records must be useful for the evaluation of the case. For instance the use of intra-oral photographs taken during treatment to evaluate the result of specific treatment mechanics.

4.19 THE DENTAL CASTS

Three sets of dental casts are mandatory. Digital models are only acceptable as part of the initial records as stereolithic or other reconstructed casts in a quality that is similar to plaster models. Final and retention models must be direct plaster/stone reproductions of the occlusal result, trimmed to EBO specifications, and /or mounted on an articulator in centric relation.

The models should show correct anatomical detail of all the teeth and the surrounding tissues.
The plaster models should be made of white orthodontic plaster, soaped and lightly polished.
The dimensions of the base of the casts are shown in the figures.
Wax or silicone bites may be useful for protection.
The occlusion will be judged by placing the upper and lower cast together with the backside of the base on the table.
The use of articulators and mounted models is acceptable.
Digital models as part of the final and/or retention records are currently unacceptable.

Identification:

A circular identification mark (for instance a coloured sticker) is placed on the front of the lower cast and on the left side of both casts.

This colour of the mark is different at the three stages of the presentation:

At the before treatment records: **black**

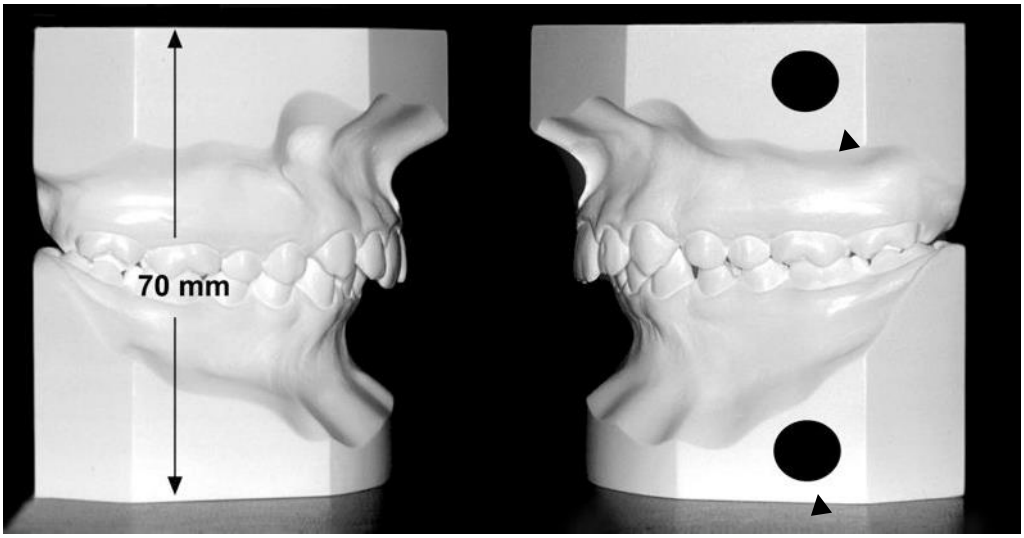
At the completion of treatment records: **red**

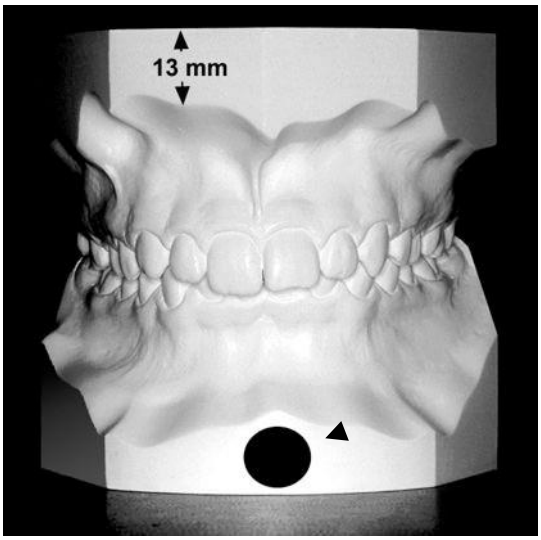
At the (post) retention records: **green**

The casts are further identified by placing a label on the back of the upper and lower casts with:

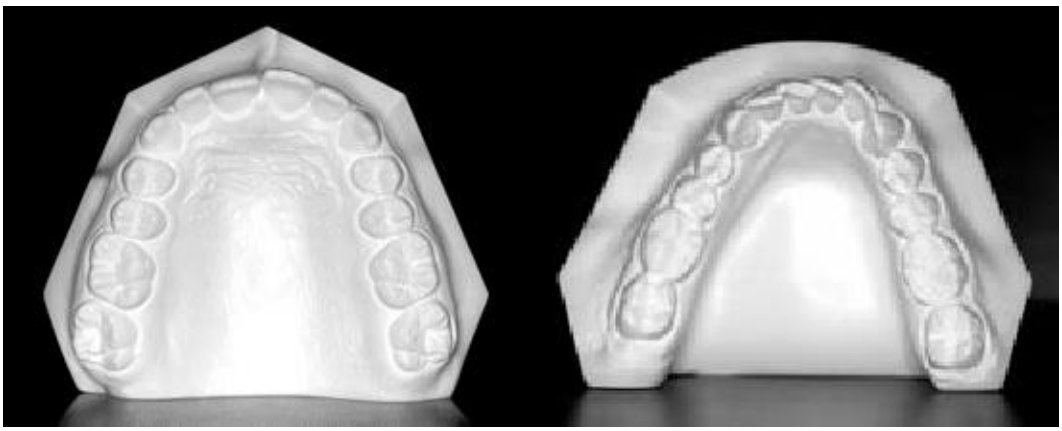
1. The candidate's number on the left side of the upper cast
2. The case number on the right side of the upper cast
3. The date the impression was made on the left side of the lower
4. The patient's age on the right side of the lower.

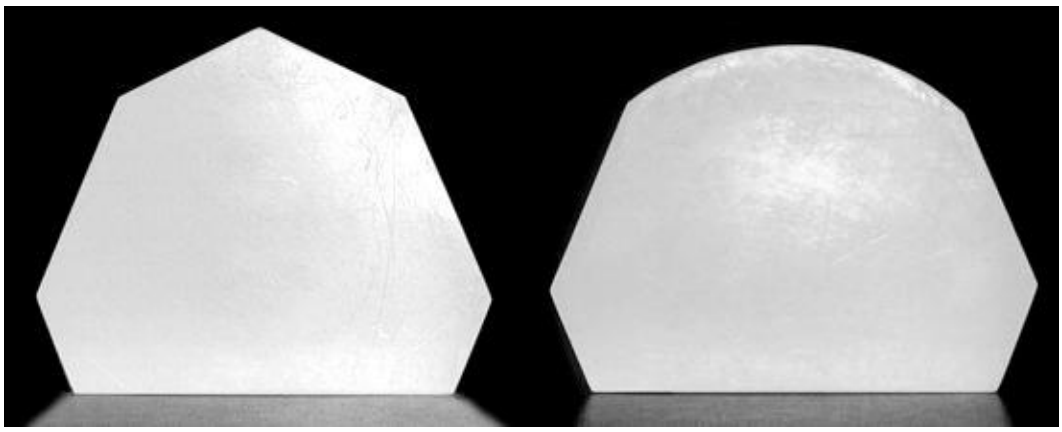
REMEMBER THAT ALL THE REQUIREMENTS FOR THE CASE PRESENTATIONS ARE MADE TO FACILITATE THE EVALUATION BY THE EXAMINERS WITHIN A LIMITED TIME FRAMEWORK AND TO AVOID OMISSIONS, MISTAKES OR CONFUSION. FOLLOWING THE REQUIREMENTS EXACTLY IS TO YOUR ADVANTAGE.

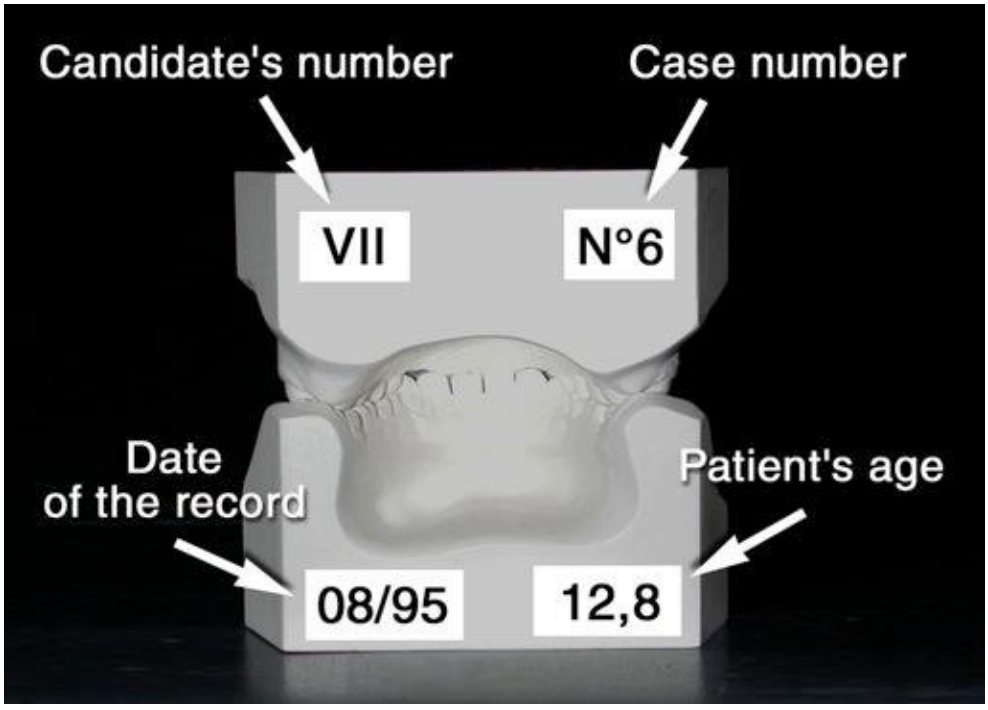




Place coloured stickers here







4.20 THE EVALUATION OF OCCLUSION ON DENTAL CASTS

With the immediate after treatment (red) cast the candidate has the opportunity to demonstrate how well he/she is able to handle the biomechanics of the orthodontic appliance used and how the occlusion changed. This means that records were taken at/ or within 4 weeks after removal of appliances.

The “at least” one year after treatment cast (green) shows the final occlusion as it has settled. This is the cast to evaluate finishing details and minor changes that occurred during settling and- possibly - further growth. It may also provide estimation on the prospects of stability.

Studies on adult dental occlusion have a long history dating back to the beginning of the last century when Angle (1899) for the first time presented a systematic description, and, in more recent years, the evaluation by Andrews (1972).

His concept of "six keys to normal occlusion" have been widely used as a standard and led to the development of pre-adjusted multi-bracketed appliances.

Longitudinal studies of development of the occlusion in orthodontically untreated individuals show that changes occur also after the permanent teeth have emerged and come into occlusion. This has been found not only in adolescents but also in adults (Moyers *et al.*, 1976; Schols and van der Linden, 1988; Duterloo, 1991). These changes include reduction in arch length and increase in crowding, particularly in the anterior areas. In addition, long-term studies of occlusal changes after orthodontic treatment (Riedel, 1977) show similar tendencies. Minor, individually patterned, changes in occlusion are common. Particularly, changes in the lower anterior area are notorious, but other treatment effects such as changes in the curve of Spee appear more stable (De Praeter *et al*., 2002). Continued facial growth after the active treatment period is seen as the major cause for the described changes. This makes "green records" of particular interest. Longitudinal, long-term studies show that the stability of a treatment result has no direct relationship to the excellence of the treatment performed and is in fact unpredictable. After treatment changes have led to the universal application of semi–permanent fixed retention and other devices and procedures to reduce the tendencies of undesirable occlusal changes (Zachrisson, 1997).

Occlusion on dental casts ("red" and/or "green") can be evaluated and appreciated in several different ways. It should be remembered that ideal "textbook" occlusion is not always a viable treatment objective in complex and difficult cases. Extreme variations in morphology of the jaw bases, crowns and/or the roots of the teeth may lead to occlusal variations that are acceptable. On the other hand changing tooth morphology is a common orthodontic procedure to improve functional occlusal fit and stability.

The Board promotes, as a general rule, that the final occlusion should be as precise as is appropriate for the case in question. However, undue lengthening of treatment and/or extended procedures to reach for an "ideal" may not be in the interest of the patient. Convincing scientific evidence is lacking that in all cases an "ideal" occlusion is essential for total treatment effectiveness. Balanced weighting of all clinical aspects of treatment characterises the mature and excellent clinician. In EBO case presentations this can be demonstrated in the descriptive texts reporting the actual treatment procedures, progress and result as well as in the dental casts and the photographs.

The literature offers a number of methods to assess "quality" of after-treatment-occlusion as a measure for quality of treatment. The Peer Assessment Rating (PAR) Index was developed in 1987

by examining over 200 dental casts (Richmond *et al*., 1992, 1994). This index has recently been used to develop a treatment outcome standard for fixed appliance treatment in the UK (McMullan *et al*., 2003). According to the ABO, the PAR index "has good reliability and validity, however this measuring system is not precise enough to discriminate between the minor inadequacies of tooth position that are found in ABO case reports" (Casko *et al*., 1998). The ABO developed an "objective grading system" after field-testing on 832 casts and panoramic radiographs. Most common inadequacies in the occlusion are an overjet of mandibular/maxillary second molars and overjet in the incisor areas; inadequate root angulation was seen most in lateral maxillary incisors, canines, second premolars and mandibular first premolars. The Board introduced the ABO measuring gauge and developed a grading system to obtain a numerical standard (Casko *et al*., 1998). With the ABO system seven different criteria are used on dental casts: alignment, marginal ridges, buccolingual inclination, occlusal relationship, occlusal contacts, overjet and root angulations. Root angulation is evaluated on panoramic radiographs.

To help candidates evaluate their after treatment casts, the "six keys to normal occlusion" (Andrews, 1972) are presented below.

4.21 IMPLEMENTING THE SIX KEYS

Candidates are encouraged to implement Andrew's "six keys to normal occlusion" when they select and evaluate their cases for presentation.

Key I pertains to the occlusion and the interarch relationships of the teeth...

This key consists of seven parts:

1. The mesiobuccal cusp of the permanent maxillary first molar occludes in the groove between the mesial and middle buccal cusps of the permanent mandibular first molar, as explained by Angle.

2. The distal marginal ridge of the maxillary first molar occludes with the mesial marginal ridge of the mandibular second molar

3. The mesiolingual cusp of the maxillary first molar occludes in the central fossa of the mandibular first molar

4. The buccal cusps of the maxillary premolars have a cusp-embrasure relationship with the mandibular premolars

5. The lingual cusps of the maxillary premolars have a cusp-fossa relationship with the mandibular premolars

6. The maxillary canine has a cusp-embrasure relationship with the mandibular canine and first premolar. The tip of its cusp is slightly mesial to the embrasure

7. The maxillary incisors overlap the mandibular incisors, and the midlines of the arches match.

The cusp-groove and the marginal-ridge conditions of the molars, the cusp-embrasure relationship of the premolars and canines, and incisor overjet can be observed directly from the buccal perspective.

The assessment of the lingual-cusp occlusion of the molars and premolars is possible when these teeth are viewed from their mesiobuccal aspect, as explained below.

Interarch relationship of the posterior teeth of two dentitions can be the same, but the interfacing of the occlusal surfaces of the two dentitions may differ because of differing crown inclinations. Judging crown inclination (and therefore occlusal interfacing) is ineffective from the buccal perspective.

It can be compared to attempting to learn whether the flanges of a hinge are together or apart by looking only at its joint.

Correct occlusal interfacing depends on correct interarch relationship, angulation, and crown inclination. Interarch relationship and angulation are best judged from the buccal perspective; crown inclination for posterior teeth is best judged from the dentition's mesiobuccal perspective. Judging posterior occlusion first from the buccal (for angulation and interarch relationship) then from the mesiobuccal aspect (for inclination) provides a perspective that can be systematically described and quantified.

Such information, along with other occlusal guidelines, provides a set of standards against which occlusal deviations can be identified.

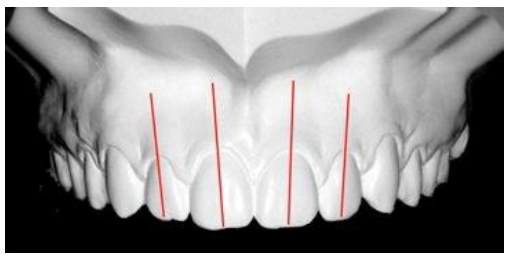
Key II: Crown Angulation

Essentially all crowns have a positive angulation.

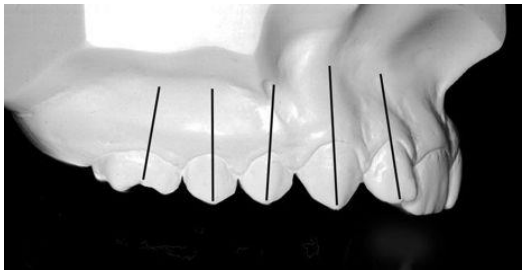
All crowns of each tooth type are similar in the amount of angulation.

Maxillary second molars are positive in angulation only if they have completed their eruption. Third molars are not present often enough to be evaluated.

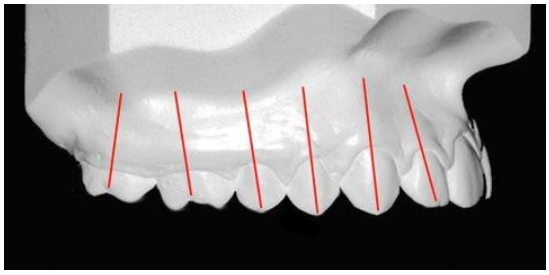
Before treatment



After treatment

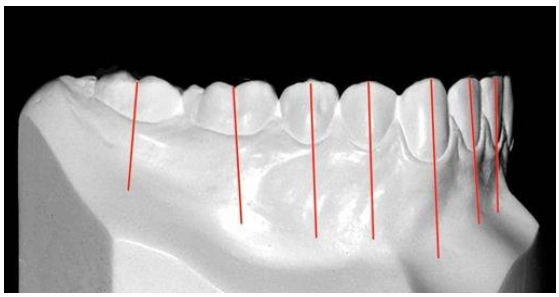


Before treatment



After treatment

Before treatment



After treatment

Key III: Crown Inclination

As they do in angulation, consistent patterns also prevail in crown inclination, with the following characteristics for individual teeth.

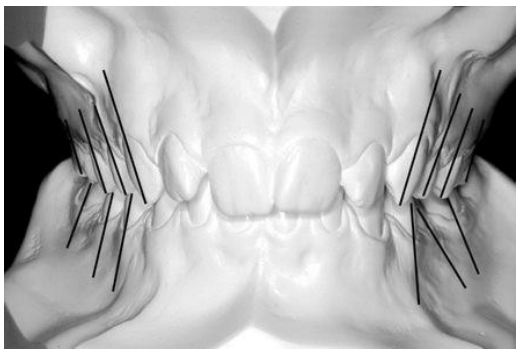
1. Most maxillary incisors have a positive inclination; mandibular incisors have a slightly negative inclination. The crowns of the maxillary incisors are more positively inclined, relative to a line 90° to the occlusal plane. The mandibular incisors are negatively inclined to the same line.

2. The inclinations of the maxillary incisor crowns are generally positive, the centrals more positive than the laterals.

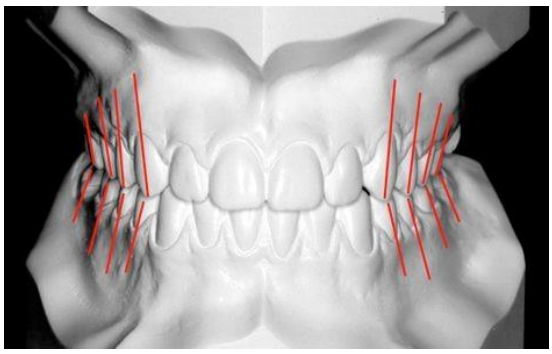
3. The inclinations of canines and premolars are negative and quite similar.

The inclinations of the maxillary first and second molars are also similar and negative, but slightly more negative than those of the canines and premolars. The molars are more negative because they are measured from the groove instead of from the prominent facial ridge, from which the canines and premolars are measured.

4. The inclinations of the mandibular crowns are progressively more negative from the incisors to the second molars.



Before treatment



After treatment

Key IV: Rotations

The fourth key to optimal occlusion is absence of tooth rotations

A well aligned upper arch

An apparently well aligned lower arch
but a careful examination shows some small rotations

Key V: Tight Contacts
Contact points should abut unless a discrepancy exists in mesiodistal crown diameter.

Key VI: Curve of Spee

The depth of the curve of Spee ranges from a flat plane to a slightly concave surface.

Before treatment

After treatment

References

Andrews L F 1972 The six keys to normal occlusion. American Journal of Orthodontics 62: 296- 309

Angle E H 1899 Classification of malocclusion. Dental Cosmos 41: 248-264, 350-357

Casko J S *et al*. 1998 Objective grading system for dental casts and panoramic radiographs. American Board of Orthodontics. American Journal of Orthodontics and Dentofacial Orthopedics 114: 589-599

De Praeter J, Dermaut L, Martens G, Kuijpers-Jagtman A M 2002 Long-term stability of the leveling of the curve of Spee. American Journal of Orthodontics and Dentofacial Orthopedics 121: 266-272

Duterloo H S 1991 Development of the dentition under the influence of functional factors In: Hunter W S, Carlson D S (eds.) Essays in honor of Robert E Moyers. Monograph No. 24 Craniofacial Growth Series, Center for Human Growth and Development University of Michigan, Ann Arbor, pp 103- 121

McMullan R E, Doubleday B, Muir J D, Harradine N W, Williams J K 2003 Development of a treatment outcome standard as a result of a clinical audit of the outcome of fixed appliance therapy undertaken by hospital-based consultant orthodontists in the UK. British Dental Journal 194:81-84

Moyers R E, Van der Linden F P G M, Riolo M, McNamara Jr. J A 1976 Standards of occlusal development. Monograph No. 5, Craniofacial Growth Series, Center for Human Growth and Development, University of Michigan, Ann Arbor

Richmond S *et al*. 1992 The development of the PAR Index (Peer Assessment Rating): reliability and validity. European Journal of Orthodontics 14:125-139

Richmond S *et al*. 1994 An introduction to occlusal indices. 2nd Edition, Mandent Press.

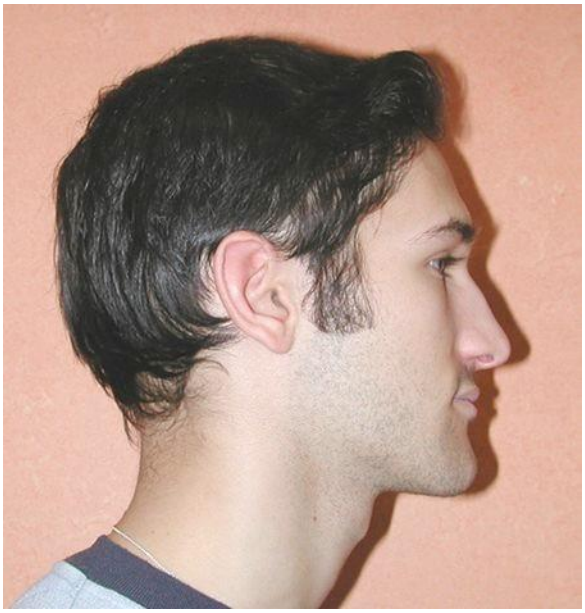
Riedel R A 1977 Post-pubertal occlusal changes In: McNamara Jr. J A (ed.) The biology of occlusal development. Monograph No. 7, Craniofacial Growth Series, Center for Human Growth and Development, University of Michigan, Ann Arbor, pp. 113-141

Schols J G J H, van der Linden F P G M1988 Gebiszentwicklung und Gesichtswachstum in der Adoleszenz. Informationen Aus Orthodontie und Kieferorthopädie 20:21-109

Zachrisson B U 1997 Important aspects of long-term stability. Journal of Clinical Orthodontics 31: 562-568

4.22 FACIAL COLOUR PHOTOGRAPHS

Frontal, frontal smiling, lateral, and (preferably) oblique facial colour photographs should be presented as prints with approximate dimensions of 5 by 7 centimetres with the head positioned in FH and so that the eyes are on one line. Avoid shadows.



Try to avoid shadows; use preferably white background.

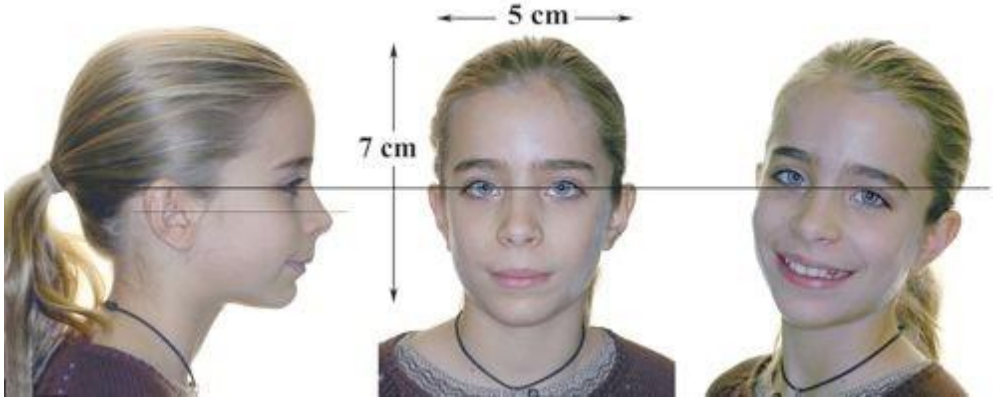
Try to position patient's head parallel to Frankfurt Horizontal (FH).

(However, an imprint of FH in the photograph in your case is not mandatory)

Avoid closed eyes

Avoid red eyes

…



Have the eyes aligned on one line; minimal dimensions of the head should be 7 and 5 cm.

If there is no breathing problem, avoid open mouth

Avoid glasses

Have the patient in a correct position in the frontal photograph
The middle image is correct.

Try to obtain a relaxed smile

4.23 INTRA-ORAL COLOUR PHOTOGRAPHS OF THE OCCLUSION

Intra-oral colour photographs of the occlusion from frontal, right, and left side should be printed in dimensions of approximately 5 by 7 centimetres. The occlusal line should be horizontal. Prints of the occlusal views of the arches are optional.

The horizontal and vertical lines in these pictures indicate the position of the dentition within the frame; there is no need to show them in your case.

Avoid taking the picture from above (bird's eye view)

Avoid taking the picture from below (frog's eye view)

Avoid large exposure of cheek/lip retractors.

Taken with a flash

Taken with a dental chair light

CHAPTER 5

EVALUATION BY EXAMINERS

5.1 WHO ARE THE EXAMINERS?

The examiners were selected on the basis of the quality of their examination result and expertise. They are nominated for a period of maximum 5 years. The number of examiners is dependent on the number of candidates. Once the number of candidates are known (February), the number and names can be determined. The list of examiners will be communicated each year to the Council of the European Orthodontic Society. The term in office may be renewed once. The number and country of origin might differ in relation to number of candidates.

5.2 HOW DO THE EXAMINERS WORK?

For all parts of the examination a score of at least 65% is required for a pass. A case evaluation form is used with a sequence of marks for each case. No more than 10% of the marks can be gained from the quality of the records. There is little possibility for compensation of marks within a case, or between cases and the oral examination. The difficulty of a case is given due consideration when assessing the marks. The use of the case evaluation form helps the examiners to calibrate, to be systematic and objective. It also allows the possibility to give balanced weighting to all aspects of the case and not just single out, for instance, purely the post-treatment occlusion. The texts therefore play a major role in the evaluation, as this is where the candidate can explain the rationale for clinical decisions and actions, describe difficulties encountered during treatment, or express doubts or self-criticism on particularly controversial aspects of the treatment provided.

Two examiners, working independently, see each case. After evaluation of all cases they compare their results and make a weighted judgement. If this is not possible the complete committee judges the case(s) or discusses the oral examination to arrive at a decision. Different examiners act for the oral examination independently and they are unaware of the judgement of the cases. The final judgement on the cases and the oral examination takes place at the adjudication meeting. All final decisions of the Examination Committee are corporate decisions. The Chairman of the Committee functions as "*Primus inter pares*".

5.3 THE EBO CASE EVALUATION FORM

	SCORE	MINIMUM	MAXIMUM
Photographs			2.5
Dental casts			2.5
Radiographs			2.5
Ceph. tracing			2.5
Total records		6.5	10
Observations			5
Diagnosis			5
Treatment plan			10
Explanation of plan			10
Total clinics		19.5	30
Improvement of dentofacial aesthetics			10
Efficiency therapy/difficulty of case			30
Finishing of occlusion			10
Stability of treatment result			10
Total therapeutics		39	60
TOTAL of CASE		65	100

The examiners, to systematically evaluate each of the cases individually use the form printed above. The evaluation contains three parts: records, clinics, and therapeutics. The content of each part is indicated in the diagram above. The total number of marks to be gained on a case is 100. The minimum number of marks to be successful = 65 (65%). This holds for each of the three parts of the evaluation. As one can see 30 marks (30%) can be gained by efficient treatment in a difficult case. The Board promotes the presentation of difficult cases.

5.4 THE RULES FOR COMPENSATION

1. COMPENSATION WITHIN ONE CASE

1.1 Compensation within records is possible. Records cannot compensate to clinics and/or therapeutics. Clinics and therapeutics can compensate to records, but the minimum for the records of that case should be at least 55% = 5.5 marks to allow compensation.

1.2 Clinic: compensation within clinics is possible. Therapeutics: compensation within therapeutics is possible.

1.3 Compensation between clinics and therapeutics is possible

1.4 Clinics plus therapeutics must be 65% = 19.5 + 39 = 58.5 marks

2. COMPENSATION BETWEEN THE 8 CASES:

2.1 The minimum number of marks for 8 cases = 520 marks.

2.2 Compensation is possible for one case, if that case has at least 55 marks. Below 55 no compensation, leading to deferral of the candidate.

2.3 For that compensation one needs 30 marks if the case is between 55 and 60; at least 10 marks if the case is between 60 and 65. Marks from records cannot be used.

3. COMPENSATION WITHIN THE ORAL EXAM:

3.1 Compensation between the two cases: yes, but if both cases are below 65 the candidate is deferred for the full examination.

4. COMPENSATION BETWEEN CASES AND ORAL EXAM:

4.1 No compensation from oral to cases.

4.2 Below 55 marks for the oral: no compensation; 55 marks or above: compensation with marks from cases: between 55 and 60: 30 marks, between 60 and 65: 10 marks. Marks from records cannot be used.

5.5 THE FORM TO PRESENT THE EXAMINATION RESULT

The form below is used by the Examination Committee to evaluate the examination. All the totals for records, clinic and therapeutics will be filled in. This form and all other individual data remain confidential and will not be given to anybody else. The Examination Committee, for its confidential reports to the EOS Council, may use data (anonymous) for statistics and policy development.

CANDIDATE	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	MINIMUM	MAXIMUM
Photographs										2.5
Dental casts										2.5
Radiographs										2.5
Ceph. tracing										2.5
Total records									6.5	10
Observations										5
Diagnosis										5
Treatment plan										10
Explanation of plan										10
Total clinic									19.5	30
Improvement of aesthetics										10
Efficiency therapy/ difficulty of case										30
Finishing of occlusion										10
Stability of treatment result										10
Total therapeutics									39	60
TOTAL of CASE									65	100

EBO 200.. CANDIDATE …. RESULT CASES

Total score cases =…/8 =..... Minimum score = 520 / 8 = 65

5.6 POSTSCRIPT

Though the EBO examiners regularly calibrate their judgement to be as objective as possible, some subjectivity is unavoidable. On the other hand clinical procedures, perfectly applied and accurately described, together with intelligent, elegant solutions to complex orthodontic problems effectively show ability and treatment results that can be reliably identified as excellent. It is obvious that candidates select the very best available material, but it is unlikely that the presented cases would be unrepresentative of the professional standard of that clinician. It is therefore our opinion that the successful candidate is most likely an excellent clinician.

Candidates usually find the examination a tremendous professional challenge and for most of them, after many months of painstaking preparation, it is an enormously rewarding, if a somewhat stressful day. The successful candidates are quite rightly proud of their achievement and we have yet to meet a successful candidate who did not think the EBO was a very worthwhile pursuit of clinical excellence.