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CLINICAL SECTION

A comparison of current Orthodontic Board examinations

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Five orthodontic clinical Board examinations were systematically compared. An attempt was made to critically evaluate the procedures, characteristics and requirements of these examinations. Many similarities were found and the differences found between Boards may be due to differences in socio-political goals of the professional orthodontic societies organizing the examinations. By setting a high standard of clinical treatment as a basic goal, all Boards aim to raise the overall quality of clinical performance.

Key words: Orthodontics, examinations

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Introduction

In the USA, the American Board of Orthodontics has existed since 1929 as an independent peer review institution, supported by the American Association of Orthodontists. Recently, several national Orthodontic Board examinations have been introduced. For example, the European Orthodontic Society set up the international European Board of Orthodontists (EBO) examination, with the first EBO examination being held in 1997. One aim of these examinations is to encourage orthodontic specialists to participate in voluntary peer review, thereby acting as stimulus leading to an improvement in the quality of treatment.[1]

The aim of this article is to compare the various Board examinations to identify both similarities and differences.

Methods and material

We compared the following five examinations: EBO (European Board), BFO (France), IBO (Italy), ABO (Austria) and ABO (USA, American Board Clinical Part III) by viewing their Internet sites (www.americanboard-ortho.com; www.sido.it; www.voek.org.at). Additional information was obtained by contacting the organizing bodies of the examinations. Efforts were taken to obtain the most recent (2003) regulations. A "German 'Board of Orthodontics'" also exists, but this is an organization for the continuing education of orthodontic specialists and, therefore, has been excluded from the study.

Results

The information is presented in Tables 1–3. Table 1 is an overview of the general set-up and procedure of the various examinations. Table 2 illustrates with details of the case presentations. Table 3 provides information on the examiners, the oral examination and the evaluation process.

General information (Table 1)

Relations to professional organizations. The Board's examination committee is a sub-group of the professional organization with executive powers and, in many cases, it is fully independent of its parent body. The American Board, for instance, is fully independent in both its constitution, and its rules and regulations. However, the European Board is dependent for its regulations on the European Orthodontic Society. The EOS decides on matters such as the general set-up of the examination, but does not interfere with the actual examination or the evaluation of candidates. The Italian organization SIDO has set-up the IBO, but the board is absolutely independent of the parent body.

Type of Board. The only truly international board is the EBO, which from a practical point helps to overcome potential complicating problems or misunderstandings (e.g. language difficulties or variation in socio-cultural aspirations).

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Table 1 General information and set-up of examination

	EBO	BFO (France)	IBO (Italy)	ABO (Austria)	ABO (USA, clinical III)
1 Organization	EOS	FFO	SIDO	VÖK	AAO
2 Type of Board	International	National	National	National	National
3 Set-up of examination	Cases and oral	Cases and oral	Cases and oral	Cases and oral	Cases and oral
4 Evaluation	All cases and oral at one occasion at 65%, 2 new chances	Gradually, after discussion/collecting cases max. time = 5 years	All at once/2 new chances	Unclear collecting cases	Gradually after discussion/
5 Internet		?	Yes	Yes	Yes
6 Information to candidates	Limited instructions sent after application	Very, precise booklet/ CD-ROM	Yes, on Internet	Booklet, limited instructions	Very laborious and precise on Internet available
7 Eligibility	Specialist in own country; 3 years training; 5 years in practice	3 years training; 5 years in practice; registered specialist	Member of SIDO, 5 years in practice; limited to orthodontics; registered with Italian Medical Association	Practice limited; 5 years in practice No specialist	Registered specialist, after ABO exam I and II

Table 2 Case presentation

	EBO	BFO	IBO	ABO	ABO(USA)
1 Selection of cases treated by candidate solely	Yes, no exceptions	Yes	Yes, no exceptions	Yes, no exceptions	Yes, but with very strict exemptions
2 Anonymity in case presentations	Yes	No	Yes	No	No
3 Number of treated cases	8	10	8	8	10
4 Alternatives	No	No	No	No	Yes:12 untreated cases; 6 treated within 5 years
5 Mandatory material	Text boxes unalterable	Tick boxes minimal text	Yes, very strict	Yes, very strict	Yes, very strict
6 Requirements for types of malocclusion (categories)	Yes, but one replacement case	Yes, but 2 cases free; + 1 replacement	Yes, very precise, no replacement	Yes, but with various choices	Yes, very precise; alternative for case #1 or# 2/ or according to discrepancy index
7 Language.	English	French	English/ Italian	German	American
8 Requirements for Green* Records	Yes, at least 1 year after completion	Yes, at least 1 year after completion	Not mandatory	Not mandatory	Not mandatory
9 Requirements for radiographs/cephs/pano's	No red or green ceph/only red pano	3 complete sets	2 complete sets	2 complete sets	2 complete sets
10 Cephalometric assessments	Morphological assessment mandatory	Morphological assessment mandatory	Morphological assessment mandatory	Prescribed analysis (VÖK)	Cephalometric summary sample form
11 Superimposition	Not mandatory/ desirable if available	Yes, prescribed method	Not mandatory/ desirable if available	Not mandatory/ desirable if available	Yes, prescribed method

*All Boards use the same color codes for records: pre-treatment, black; immediate post-treatment, red; final records, green.

Set-up of examinations. All Board examinations are in two parts: first, a presentation of cases and, secondly, an oral examination. The organization and content of the oral examination differs between the examinations (Table 3), as do the requirements for the case presentations (Table 2).

Evaluation. The most significant differences are that the EBO and IBO employ a system whereby the candidate has to take the whole exam at one time where all cases and the oral presentation are assessed. A deferred candidate may return for two further sessions with new material after a predetermined time. Other Boards have a system where the candidate can work incrementally to reach the required standard (France and USA).

Internet. Not all Boards have full and comprehensive information available on the Internet, although those who don't are actively developing this facility.

Information to candidates. Large differences exist between the amount and quality of information available to potential candidates. The EBO has, up to now, limited information available after request to the EOS Office. The ABO (USA) and IBO (Italy), however, have fully comprehensive information available in a downloadable form from the Internet. Full details of the BFO (France) is available on CD-ROM, which is mailed to potential candidates. The Austrian Board provides written instructions in booklet form.

Eligibility. This important aspect determines who is allowed to participate. Generally, only those who have followed a recognized (in their respective countries) specialist education are eligible. However, there are differences in what constitutes 'specialist education' between some European countries. Dental surgeons, both general dental practitioners and oral surgeons, are naturally not eligible to sit the Orthodontic Boards. The conditions for eligibility seem closely related to professional circumstances in the different countries.

The EBO, as an international board, does not accept applications from countries where there is currently no specialist registration or where a candidate has not undergone a 3-year specialist training, which effectively rules out participation from several European countries.

Table 3 Examiners, oral examination and evaluation

		EBO	BFO	IBO	ABO	ABO (USA)
1	Examiners	Nominated by EOS/members EBO	Best candidates	International in part/selected by SIDO	Selected by president of Examination Committee	Complicated election system by AAO
2	Oral examination	2 unseen cases	Discussion of cases	1 unseen/1 selected by examiners	2 unseen cases	2 unseen cases + discussion of cases
3	Difficulty of the presented cases	No; included in marking system	Yes; detailed handicap system	No; included in marking system	No; included in marking system	Discrepancy index system
4	Maximum of marks per case	100	100	90	Unclear	Unclear
5	% Marks for quality of records	10%	20%	10.8%	'Gering' (small)	Unclear
6	% Marks for clinical assessment (observations, diagnosis, plan)	30%	20%	10.8%	Unclear	Unclear
7	% Marks for actual treatment	60%	60%	68.4%	Unclear	Unclear
8	Relative importance of finished occlusion	+	++	++++	Unclear	Unclear
9	Objective measurement of occlusal result	No, but instructions for examiners	Yes, with precise system of marks	No, but instructions for examiners	Unclear	Yes, with 'objective grading system' by candidate
10	Minimum of pass mark	65%	All cases needed to be accepted	50%	Unclear	All cases needed to be accepted
11	Oral examination	Minimum 65%	Unclear	50%	Unclear	Unclear
12	Compensation	Very limited strict rules	No	No	Unclear	No

The EBO, BFO (France) and IBO (Italy) request that a candidate has been working for at least 5 years in practice limited to orthodontics. The eligibility of a foreigner for a national (French, Italian or Austrian) Board examination are as yet unclear. The ABO (USA) is only eligible for those with an American registered training, whereas the EBO is open to anybody who fulfils the requirements regardless of nationality.

Case presentation (Table 2)

Selection of cases. Candidates are usually requested to make a declaration stating that they have treated the presented patients 'solely and with full responsibility'. This rules out the possibility of presenting cases treated during post-graduate training. It also means that cases treated in group practices by many different clinicians cannot be presented. The ABO (USA) has, however, some exceptions to this strict ruling.

Anonymity in case presentations. The EBO and IBO request that case presentations are anonymous and the identity of the candidate is only revealed after the examination. This measure is of course only possible if one has to present all cases at one sitting. When the group of candidates is large, as in the American Board examinations, this may not be so relevant.

Number of treated cases. This number varies from 8 with three of the Boards, to 10 with the French and American Boards, without obvious reasons for these differences.

Alternatives. The ABO (USA) is the only Board where one can present cases prospectively and the examiners then select 6 from a pool of 12 untreated cases. The candidates then have to present the finished cases within 5 years of enrolling for the Board.

Mandatory material. All examinations have strictly prescribed the mandatory material and usually provide the candidate with pre-printed forms. This is most evident for the FBO (France) where written text by the candidate is almost eliminated and forms are presented with appropriate boxes to be ticked. The EBO has restricted the volume, as well as the categories of text to a number of limited textboxes. The EBO considers text written by the candidate a very important part of the case assessment diagnosis and treatment planning.

Requirements for types of malocclusion. All examinations have strictly prescribed categories of malocclusion. The various types of required categories do not differ greatly between the Boards; however, some Boards allow the candidate some flexibility by allowing substitution of some categories of case. Additional restrictions exist with some Boards; for instance, only one case may involve orthognathic surgery and/or extensive prosthodontic reconstruction, or specific cephalometric requests such as high mandibular plane angle of $>35°$, or extractions and non-extraction Class II division 1 cases. The prescription of specific types of treatment or categories of morphological characteristics within the subdivisions of malocclusion, undoubtedly makes the examination more difficult for potential candidates.

Language. The IBO requires a limited text in English from all candidates to allow evaluation of the clinicians work by foreign examiners, unfamiliar with the Italian language.

Requirements post-treatment records. 'Green' records refers to a third set of clinical records usually at least 1 year after completion of treatment. Currently, only the EBO and the BFO (France) require 'green' records. For the EBO, only 'green' casts and colour photographs are mandatory.

The BFO (France) is the only Board requesting complete radiographs for all cases at the 1-year post-treatment stage. The EBO does not require a post-treatment ('red') or 'green' cephalogram. However, a post-treatment ('red') panoramic radiograph is mandatory. All other radiographs are not mandatory, but desirable if available, depending on the specifics of the case. This follows the guidelines of the British Orthodontic Society.[2] Presentation of unnecessary records may count against the candidate.

Cephalometric assessments. All exams have a prescribed pre-treatment assessment. EBO, BFO and IBO have a mandatory morphological assessment form with a limited number of measurements. The purpose of limiting the assessments is to make it easy for examiners to familiarize themselves with the type of case. EBO candidates are free to use any additional cephalometric analysis, as long as it is explained clearly as to the need and benefits of this additional assessment.

Superimposition. BFO and ABO (USA) have a prescribed procedure for superimposition. The EBO and the IBO consider superimpositions not mandatory, but desirable and these can be presented as additional material. Björk's method is recommended by the EBO; however, any other method is accepted, if clearly explained.

Examiners, oral examination and evaluation (Table 3)

Examiners. The American Board has adopted a system to elect their examiners (Directors) so that all regions are represented. In the Austrian Board examiners are nominated by the President of the Board. In France, the candidates who presented the best examination results are nominated according to strict predetermined regulation system. The examiners of the European Board must be members of the Board, and are proposed by examiners and nominated by the EOS Council on the basis quality of examination result and expertise. For the EBO, extra examiners are occasionally required to solve possible language problems. The EBO has the rule that those examiners who examine the cases are different from those who do the oral section. The IBO invites foreign 'experts' as examiners to increase objectivity of the process.

Oral examination. EBO candidates are given two unseen cases to diagnose and plan treatment, and these are then discussed with examiners. In the IBO, 1 unseen case and 1 case selected by the examiners are discussed. In the BFO (France) oral examination ' the candidates clinical cases are discussed'. In the ABO (USA) exam, the case presentations and 2 unseen cases are discussed.

Difficulty of the presented cases. Measurement of the difficulty of the presented case is not at all clear in most examinations. No definition of 'difficulty' is provided thus resulting in confusion. The French Board is the only examination that has included a system of handicap points. These are awarded in relation to dental, occlusal and cephalometric values The ABO (USA) has developed a Discrepancy Index system. In 2004, candidates can chose to select cases either according to Categories or to the DI system.

Maximum of marks per case. Details are given in Table 3.

Percentage of marks for records. The percentage of marks to be lost or gained from quality of records is small in most Board examinations. However, the possible marks in the BFO (France) are double that of the other examinations.

Percentage of marks for clinic. The percentage of 'clinical assessment' (observations, diagnosis and plan of treatment) is 30% in the EBO. This is in accordance with the policy to emphasize the significance of proper formulation of observations, allowing a proper diagnosis and treatment plan. The use of the textboxes also encourages succinct prose and, hopefully, eliminates verbosity.

Percentages of marks for therapy. These percentages, are remarkably similar as far as is known.

Percentage for occlusion only. In contrast to the similarity of the overall percentage for therapy, this percentage shows very large discrepancies ranging from 16 to 72%. Apparently, the importance of the post-treatment occlusion as part of the total case evaluation is controversial.

Measurement of occlusal result. The ABO (USA) uses a measuring system as a standard after extensive field-testing.[3] BFO (France) uses a comparable grading/marking system with visual inspection. IBO gives instructions to candidates and examiners what to look for. The ABO (USA) grading system presumes to objectively measure quality of post-treatment occlusion. Candidates are asked to score their own post-treatment casts (and panoramic radiographs) before the examination. The aim is 'that they can select cases that are likely to pass, resulting in the low failure rate'. According to the American Board, this system '. . . helps to satisfy our mission of establishing and maintaining the highest standards of clinical excellence and to contribute to the development of quality graduate education programs in orthodontics'.[4] In the phase III clinical part examination of February 2002 only 1.9% of the cases were unacceptable due to occlusion. The total pass rate was 89%, which were the best results in the history of the American Board.[4]

Minimum of pass marks. The examinations where the candidate has to present all clinical cases on one occasion (EBO and IBO) have different percentages: 65 and 50%, respectively.

Marks for oral examination. Minimum pass marks similar or same as to that for cases.

Compensation. Compensation can occur within the case and/or between cases and the oral. EBO has precisely defined rules for limited compensation for inadequate performance in a minor aspect of the exam. Compensation for poor clinical decisions with extra marks from high quality records is not allowed. For examinations where the candidate works incrementally towards the required standard, rules for compensation between cases may not be applicable or necessary. In the IBO examination, no compensation is given.

Discussion

It is interesting that no Board requires demonstration of any specific treatment procedure, but only defines categories of types of malocclusions to be treated. When reflecting on the general format, the practical design and regulations of the current examinations, we could conclude that some exams appear strict, whilst others seem somewhat easier and more flexible. The most important factors appear to be the number of cases to be presented, the requirements for the types of malocclusion, the mandatory types and quality of records, and the mandatory presentation of (complete) 'Green' records.

The reasons for these variations are not always clear. These may reflect variation in the perception of the educational and or political goals of the Board or professional organization. The EBO, for example, limits its goal 'to identifying excellence of clinical performance'. As a result, if you present to the EBO you must be seen to be able to achieve their standard of clinical excellence.

One important difference is the requirement for different stages of records, i.e. whether 'Green' records are required. A few years ago, the ABO (USA) stopped requesting 'green records'. This was done to make the examination more accessible, as it appeared unduly difficult to maintain contact with patients over prolonged periods after treatment has been completed. An additional factor might be that widespread acceptance of semi-permanent retention procedures make the presentation of 'green records' somewhat superfluous. Also longitudinal, long-term studies show that the stability of a treatment result has no direct relation with the excellence of the treatment performed and is, in fact, often unpredictable.

Recently, European legislation has led to restrictions in taking radiographic records after treatment.[2] On the other hand, dental casts plus adequate photographs of the occlusion in 'habitual occlusion', recordings of the 'functioning' dentition and accurate standardized facial photographs, may considerably contribute to a proper case evaluation.

The evaluation of the (post-treatment) occlusion is apparently a controversial subject considering the large differences in the weighting of that aspect (Table 3, point 8). It is, as yet, unclear if the introduction of the 'objective grading system' by the American Board will resolve this controversy.

Candidates will, naturally, have the strong tendency to avoid anything that could create a problem for them in the exam. The occlusion presented as an 'after-treatment' record may be taken within 1 year after appliance removal. Candidates may therefore not show the treatment result immediately on appliance removal. Alternatively, they may show a case that improved by 'socking-in' or 'settling'. Of course, one may argue that this is part of the normal treatment process. What remains unclear, however, is what is actually demonstrated on the dental casts. In addition, recent studies indicate that the evaluation of panoramic radiographs for root parallelism is unreliable.[5]

At the start of the European Board in 1997, anecdotal reports from EBO examiners who had the opportunity to see ABO (USA) case exhibitions, mentioned that 'many' easy cases were shown. It is, as yet, too early to determine if the introduction of objective grading has drawbacks not highlighted in the examination results.

Relatively recently, due to the low numbers of candidates, the ABO (USA) has changed its policies. First of all, the examination was made easier by not requiring 'Green records'. Secondly, the so-called 'objective grading system' was introduced and, recently, the Discrepancy Index. The political goal now aimed for is to have most orthodontists Board certified. Interestingly, the ABO (USA) is the only Board that defines as one of the goals: 'to contribute to certification throughout the world'.

The ABO (USA) and also the French Board have a training or educational element in their system. Rejecting cases is thought to encourage the candidate to improve so that he/she can gradually 'collect' the accepted cases required.

While eligibility is completely clear in the USA or in France, it is not entirely clear for the EBO, due to the variation in training systems and specialist registration in Europe. This is an issue of concern for some Boards. The EBO particularly has a problem with eligibility, given that it is part of a European professional organization, as significant groups of potential candidates from several countries are '*de facto*' excluded. As such, the EBO is apparently used to exert pressure to reach common European training and recognition of standards. It might be necessary to reconsider the position of the EBO within the structure of future United Europe as a means to raise professional quality and to set clinical standards of continuing education programs in orthodontics.

Re-certification is a means of maintaining professional standards. This would mean that membership of the Board would not be for life, but limited in time. The American Board has started to evaluate this system. One way to maintain standards appears simple and may prove satisfactory: for example, Italian Board members present one new case every second year during the IBO examination.

It might be considered that universal application of modern pre-adjusted appliances will ease treatment procedures of a large proportion of malocclusions. Other, more complicated conditions may continue to require highly qualified expertise adapted to that individual patient. This may lead to a shift from the importance of the case presentations towards the importance of the oral examination as a means to test practical application of high quality, specialized, and up–to-date procedures and knowledge. Refinement of the descriptions of categories is another possibility to stimulate the presentation of 'difficult cases'. This will also influence the attempts to make evaluation of examination results objective. Objectivity is also increased by anonymous case presentations. However, skilful, fair and personal individual expert judgment by well-calibrated examiners may continue to be required, making some subjectivity unavoidable.

Conclusions

Board examinations differ in content. The apparent reasons for these differences are differences in the professional and political goals of the professional organizations. There is no obvious indication that the examinations differ greatly in the attempt to measure clinical excellence. Board examinations are systematically evaluated, and changes and adaptations continue to occur as a result of developments in the practical application of orthodontics and the goals of the Boards. Fair and objective judgment remains a subject of on-going concern. However, subjectivity can probably not be completely eliminated.

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References

1. Sandler J, Duterloo HS. European Board of Orthodontists — a professional challenge. *J Orthod* 2003; **30**: 145–52.
2. Isaacson KG, Thom AR. *Orthodontic Radiographs: guidelines*. London: British Orthodontic Society, 2001.
3. Casko JS, Vaden JL, Kokich VG, *et al*. Objective grading system for dental casts and panoramic radiographs. *Am J Orthod Dentofac Orthop* 1998; **114**: 589–99.
4. James RD. Objective cast and panoramic radiograph grading system. *Am J Orthod Dentofac Orthop* 2002; **122**(5): 450.
5. McKee IW, Glover KE, Williamson PC, Lam EW, Heo G, Major PW. The effect of vertical and horizontal positioning in panoramic radiography of mesiodistal tooth angulations. *Angle Orthod* 2001; **71**: 442–52.