

# ABO resident clinical outcomes study: Case complexity as measured by the discrepancy index

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In the fall of 2001, the American Board of Orthodontics (ABO) began a committed discussion of early certification after graduation from a recognized orthodontic training program. The board's intention was 2-fold: to evaluate the possibility of offering early certification to recent graduates by using cases treated during their residencies, by determining whether resident treatment quality could satisfy current board certification criteria; and to allow orthodontic resident programs to evaluate the efficacy of their clinical training by using a standardized examination.

In the summer of 2002, 20 orthodontic programs from across the United States were invited to participate in the ABO's resident clinical outcomes study (also known as the pilot study). Official agreements between the orthodontic programs and the ABO were executed, and 16 programs committed to the pilot study. Programs participating in the pilot study will evaluate a standardized clinical examination for measuring the outcomes of their clinical orthodontic training.<sup>1-3</sup>

This past summer, the ABO attempted to answer a new question with the pilot study data: how does the complexity, as measured by the ABO discrepancy index (DI), of the pilot study cases treated by orthodontic residents compare with that of cases submitted by practicing orthodontists for the ABO phase III examination?

## PILOT STUDY PROTOCOL

With faculty guidance, each resident in the pilot programs identified 12 cases, from which up to 6 would later be selected for final submission. Pretreatment cephalometric and intraoral radiographs were sent to the board for each of the 12 cases per resident. The model is similar to the current option II pathway for board certification. However, in the absence of case category requirements,<sup>3</sup> the board relied on faculty to determine whether the cases were adequately complex for inclusion in the residents' pilot study patient population. Beginning in August 2004, as the 2-year programs concluded, and continuing into 2005 as the 3-year programs adjourn, pilot study participants have a time period to submit final case records to the ABO. Program chairpersons will confirm that each patient was treated solely by the resident and his or her attending faculty member from diagnosis through treatment planning and completion.

By February 2006, the ABO examining team will have evaluated up to 456 cases. To assure an unbiased evaluation, the examiners will be blinded to the identity of the graduate and the school. The final published results will also be blinded. A special report will be sent to each participating orthodontic program disclosing the performance of its graduates, the total performance scores of the program, and how it compared with other programs in the study.

A control sample, comprising data from the ABO phase III candidates' clinical examination case record summaries, was gathered in 2003 and 2004 ( $n = 625$ ); additional data will be gathered in 2005. These data will be assessed with the ABO DI,<sup>2</sup> case management data,<sup>4</sup> and the objective grading system.<sup>1</sup>

## CASE COMPLEXITY COMPARISONS

As a first step in the evaluative process, the DI data for the pretreatment records of each case from the 16 schools ( $n = 857$ ) were evaluated so that the ABO could deter-

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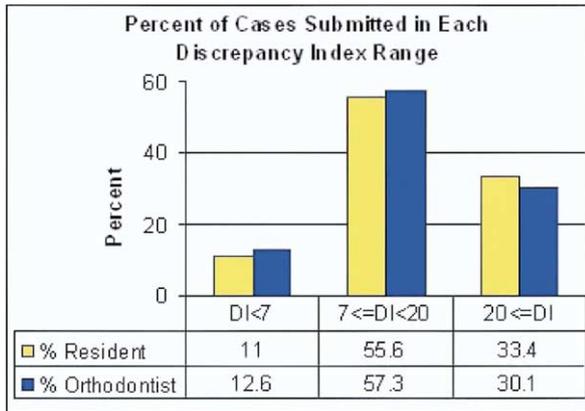
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**Fig 1.** Distribution of cases submitted in each discrepancy index range.

mine whether the complexity of the cases in the pilot study was sufficient to qualify for the present phase III examination. The ABO DI, an alternative to the case categories, is used by the board to summarize the clinical features of a patient's condition by using a quantifiable and objective list of target disorders representing a number of the common elements of an orthodontic diagnosis. This system eliminates the candidate's dependence on locating a particular case type (case category)<sup>3</sup> to proceed with the phase III clinical examination.

For this report, any case with a DI score greater than 50 was excluded as an outlier; 4 such cases were excluded from the pilot study and 7 from the control sample.

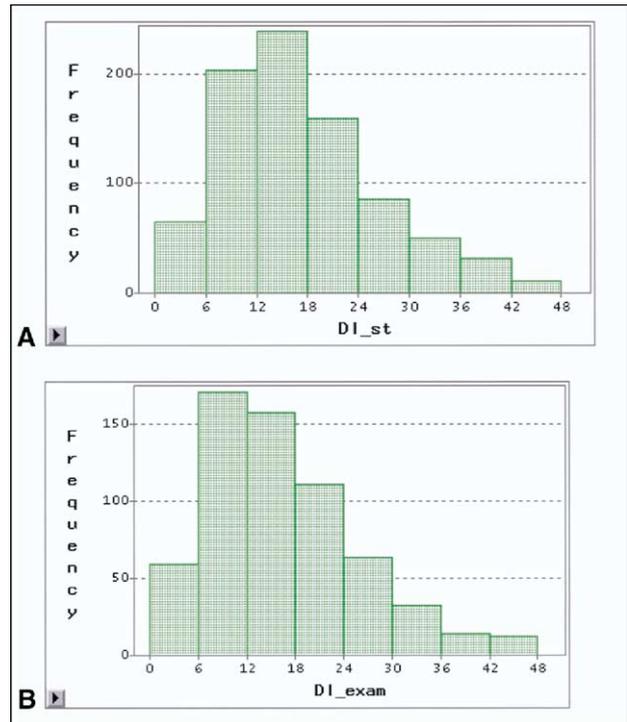
The 16 schools participating in the pilot study were asked to submit the DI data for each of 12 cases per resident selected for possible inclusion. The following questions were posed:

1. Were the cases submitted by the orthodontic residents sufficiently complex to qualify for the current ABO phase III examination?
2. Were the cases equally distributed among the residents of each program with respect to their DI complexity?
3. How did residency cases compare with those presented for the ABO phase III examinations with respect to the DI?

**RESULTS**

A total of 857 pretreatment cases were submitted by 76 residents at 16 orthodontic residency programs. The pilot study contract did not include DI guidelines for submission requirements.

These residents' cases were compared with a random sample of 625 pretreatment cases submitted by



**Fig 2.** Distribution of DI case complexity scores. **A**, Resident-treated cases in pilot study (n = 857, mean 17.2, SD 9.7); **B**, orthodontist-treated control cases (n = 625, mean 16.1, SD 9.5).

orthodontists who were candidates for the phase III examinations in 2003 and 2004. The distribution of case data was compared by using 3 defined category ranges of discrepancy. As **Figure 1** shows, the distributions were remarkably similar.

The discrepancy data were not normally distributed (**Fig 2**). The data were skewed right because there was a lower limit of 0 for the discrepancy scores. Most (89%) of the cases selected by the schools for this study had a DI greater than or equal to 7 (**Fig 2**).

The mean DI scores for the residents and the phase III cases were 17.2 and 16.1, respectively (**Fig 2**). With one exception, every school program either qualified all 12 cases per resident or would have qualified them if the cases had been reallocated among the residents in the same program. The exception was a residency program that submitted cases with significantly lower DI scores. Only 25% of the residents' DI scores from that school qualified, with DI scores of 7 to 19 and above 20. Because we presumed that most schools assigned  $45 \pm 15$  new cases per resident, we do not know whether the outlier school intentionally submitted less complex cases.

## CONCLUSIONS

Based on the reports for the DI from the 16 schools, we concluded that:

1. Residents' cases were typically sufficiently complex to qualify for the ABO phase III examination evaluative process.
2. DI scores of cases submitted by the residency programs and candidate cases submitted for the phase III examinations in 2003 and 2004 were remarkably similar.
3. With respect to case complexity as measured by the ABO DI, there appeared to be an equally wide range among the 857 resident cases and the 625 orthodontist candidate cases submitted for the 2003 and 2004 ABO examinations.
4. A residency case assignment protocol that parallels the case complexities in a contemporary orthodontic practice would assure that each resident is exposed and trained to similar standards.
5. A very high percentage (89%) of the residents' case submissions had a DI score above 6. A DI score of 7 represents a simple Class I condition with an arch length-tooth size discrepancy greater than 7 mm in the most crowded arch.

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