National Board Dental Examinations
Standard Setting Update

David M. Waldschmidt, Ph.D.
Secretary, JCNDE

March 15, 2016
Mission Statement of the JCNDE

“The JCNDE develops and conducts highly reliable, state of the art cognitive examinations that assist regulatory agencies in making valid decisions regarding licensure of oral health care professionals, develops and implements policy for the orderly, secure, and fair administration of its examinations, and is a leader and resource in assessment for the oral health care profession.”
## Appointing Organizations and Current JCNDE Appointees

<table>
<thead>
<tr>
<th>Organization</th>
<th>Appointees</th>
</tr>
</thead>
</table>
| **AADB (6)** | Luis J Fujimoto, DMD, JCNDE Chair  
               Dale R Chamberlain, DDS  
               Patricia Ann Parker, DMD  
               David W Perkins, DMD  
               William F Robinson, DDS  
               Leonard P Weiss, DDS |
| **ADA (3)** | Cheryl Haley, DDS  
               Lisa Heinrich-Null, DDS  
               Rhett L Murray, DDS |
| **ADEA (3)** | Marc E Levitan, DDS, JCNDE Vice Chair  
                Frank W Licari, DDS, MPH, MBA  
                Nader Nadershahi, DDS, MBA, EdD |
| **ADHA (1)** | Melissa Gail Efurd, RDH, Ed.D |
| **ASDA (1)** | Greg P. Shank, BS |
| **Public (1)** | Issie L. Shelton-Jenkins, JD, LLM |
| **Liaisons & Observers** | Alvin W. Stevens, DMD (ADA Board Liaison)  
                           Jordan J Telin, BS (ASDA Observer)  
                           Liaisons and observers do not participate in voting |
NBDE Purpose and Interpretation

- The purpose of the National Board Dental Examinations is to assist state boards in determining the qualifications of individuals seeking licensure to practice dentistry.
- The NBDE is used to determine whether the candidate possesses the minimally acceptable level of knowledge, cognitive skills, and ability that is necessary for the safe, entry-level general practice of dentistry:
  - Part I: Anatomic sciences, biochemistry-physiology, microbiology-pathology, and dental anatomy & occlusion.
  - Part II: Dental and clinical dental sciences.
Standard Setting

- The National Board Examinations are criterion-referenced and not norm-referenced examinations.
- Subject matter experts identify standards (pass/fail points) following established procedures and criteria that reference specific skill level requirements, not by the process sometimes known as “grading on a curve.”
  - All candidates who demonstrate the necessary skill level through their examination performance will pass the examination (it is NOT the case that scoring is established to fail a certain percentage of examinees).
- The standard for each examination program is the same for all examination forms administered to candidates. This occurs through the use of equating procedures that control for subtle differences in difficulty in test items across examination forms.
- The standard for each examination is determined through a process called “standard setting”.

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Standard Setting: Overview and Purpose

• “Standard setting” refers to the structured process by which subject matter experts (SMEs) recommend a performance standard for an examination.

• The Joint Commission periodically conducts standard setting activities for the NBDE and NBDHE. The purpose of these activities is to establish a recommendation for the Joint Commission regarding the minimum score that a candidate should obtain in order to pass each examination.

• The Joint Commission conducts separate standard setting activities for the NBDE Part I, NBDE Part II and NBDHE.
Standard Setting: Overview and Purpose

- The current performance standards for the NBDE Part I and NBDE Part II were set in 2007 and 2008, respectively.

- In late 2014, standard setting activities were conducted for purposes of updating the minimum passing scores for the NBDE Parts I and II, respectively.

- The NBDE Part I standard setting activities were held on October 27-28, 2014. The NBDE Part II standard setting activities were held on November 3-4, 2014. Both were conducted at the ADA offices in Chicago, IL.

- The 2014 standard setting activities for NBDE Parts I and II were facilitated by Dr. Gregory Cizek, a nationally recognized expert in standard setting who has authored several books on the subject (Cizek 2001, 2012; Cizek & Bunch, 2007).
Standard Setting Panel Membership

- The NBDE Part I and Part II standard setting panels consisted of 10 and 12 members, respectively.
- The panels were composed of dental Subject Matter Experts (SMEs).
- The panels were selected to be broadly representative and aligned with the purpose of the examinations:
  - Practitioners
  - Dental school faculty
  - Joint Commission members
  - Members of state boards
  - Dental school deans and associate deans
  - Current and former NBDE Test Construction Committee members
  - Geographically representative
  - Gender balanced
Bookmark Standard Setting Method

• An established standard setting method called the “Bookmark” method was used for the NBDE Part I and NBDE Part II standard setting activities.

• For the Bookmark method, panelists are asked to review a representative booklet of test items that have been sorted in ascending order of difficulty (i.e., easiest to hardest). The booklet of test items is called an “ordered item booklet” (OIB).

• After reviewing the OIB, each panelist places a “bookmark” on the page containing the last item he or she believes a “just qualified candidate” would have at least a two thirds (67%) chance of answering correctly.

• The panel’s recommended performance standard for the examination is derived from the median of the bookmarked pages, across panelists.
The Just Qualified Candidate (JQC)

• The key referent in the bookmark procedure is the Just Qualified Candidate (JQC) – a hypothetical examinee whose knowledge, skills and abilities (KSAs) represent the lowest level that would still be considered acceptable to pass the examination.

• For the NBDE Part I, the JQC was defined as follows:
  “The JQC is a candidate, currently pursuing an approved training program in dentistry, who possesses the minimally acceptable level of knowledge, cognitive skills, and ability that is necessary to apply the biomedical, dental, and clinical dental sciences for the safe, entry-level general practice of dentistry.”

• For the NBDE Part II, the JQC was defined as follows:
  “The JQC is a candidate, currently pursuing an approved training program in dentistry, who possesses the minimally acceptable level of knowledge, cognitive skills, and ability in the dental and clinical dental sciences – including the areas of professional ethics and patient management – that is necessary for the safe, entry-level general practice of dentistry.”
Standard Setting Process

• Prior to beginning the bookmark procedure, panelists engaged in small-group and whole-group discussions regarding the characteristics of the JQC. During these discussions, panelists described specific KSAs they believed the JQC would and would not possess.

• To ensure that panelists were familiar with the content and difficulty of the examination, panelists were administered a “mini form” of the test that was representative of the actual examination with respect to content, difficulty, and item formats. Upon completion, they were provided with an answer key so they could self-score their mini form.

• To ensure that the mechanics of the bookmark process were well understood by all, panelists also participated in a practice bookmarking round which was conducted using a “practice” OIB consisting of 12 test items.

• Staff were available throughout the activity to provide assistance and any necessary information and clarification concerning the NBDE program.
Bookmark Standard Setting Method

- Three rounds of bookmarking were conducted. In each round, each panelist placed his or her bookmark on the page containing the last item he or she believed a “just qualified candidate” would have at least a two thirds (67%) chance of answering correctly.

- After each round, standard setting panelists were provided with the following information:
  - Information about how their bookmarked page compared to the bookmarked pages of other panelists (i.e., “normative information”).
  - Information about the prospective consequences of their bookmarked pages on the fail rate for the examination (i.e., “impact information”).

- After the second round, panelists were also provided with empirical information about the difficulty of the test items in the OIB.
Bookmark Standard Setting Method

- After each round, panelists discussed their individual bookmark placements as a group and shared their thoughts and concerns.

- The panel’s final recommended performance standard for each examination was based on the median of the bookmarked pages (across panelists) from the third bookmarking round.
Panelist Feedback

• At five points during the standard setting activities, panelists were given an opportunity to provide feedback about the standard setting process.

• The feedback was collected through a series of evaluative questionnaires developed by Dr. Cizek.

• Participants’ evaluations of all aspects of the process were uniformly strong and supportive.

• Each panelist indicated that they supported the final group-recommended performance standard.
Panelist Feedback: NBDE Part I

- Panelist feedback from the final evaluative questionnaire: NBDE Part I

<table>
<thead>
<tr>
<th>Survey Item Number and Statement</th>
<th>Mean Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The item difficulty information provided for generating the Round 3 ratings was helpful.</td>
<td>4.3</td>
</tr>
<tr>
<td>2. The instructions regarding how to use the item difficulty information were clear.</td>
<td>4.4</td>
</tr>
<tr>
<td>3. The discussion of the Round 2 Bookmark placements and instructions helped me understand what I needed to do to complete Round 3.</td>
<td>4.5</td>
</tr>
<tr>
<td>4. I am confident in my Round 3 Bookmark placement.</td>
<td>4.5</td>
</tr>
<tr>
<td>5. I had the opportunity to ask questions while working on my final recommendations.</td>
<td>5.0</td>
</tr>
<tr>
<td>6. The facilitators helped to answer questions while working on my final recommendations.</td>
<td>4.8</td>
</tr>
<tr>
<td>7. The timing and pace of the final round were appropriate.</td>
<td>4.7</td>
</tr>
<tr>
<td>8. Overall, the facilities and food service helped create a good working environment.</td>
<td>4.8</td>
</tr>
<tr>
<td>9. Overall, the materials were clear and helpful.</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Key: Values are on a five-point scale, ranging from 1=Strongly Disagree to 5=Strongly Agree; NR = no response. All table entries are based on n=10 responses.
Panelist Feedback: NBDE Part I

Panelist feedback from the final evaluative questionnaire: NBDE Part I

<table>
<thead>
<tr>
<th>Survey Item Number and Statement</th>
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</thead>
<tbody>
<tr>
<td>10. Overall, the training in the standard setting purpose and methods was clear.</td>
<td>4.5</td>
</tr>
<tr>
<td>11. Overall, I am confident that I was able to apply the standard setting method appropriately.</td>
<td>4.6</td>
</tr>
<tr>
<td>12. Overall, the standard setting procedures allowed me to use my experience and expertise to recommend cut score for the NBDE Part I.</td>
<td>4.7</td>
</tr>
<tr>
<td>13. Overall, the facilitators helped to ensure that everyone was able to contribute to the group discussions and that no one unfairly dominated the discussions.</td>
<td>4.5</td>
</tr>
<tr>
<td>14. Overall, I was able to understand and use the information provided (e.g., other panelists’ ratings, item difficulty information).</td>
<td>4.5</td>
</tr>
<tr>
<td>15. Overall, I support the final group-recommended cut score as fairly representing the appropriate performance standard for the NBDE Part I.</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Key: Values are on a five-point scale, ranging from 1=Strongly Disagree to 5=Strongly Agree; NR = no response. All table entries are based on n=10 responses.
Panelist Feedback: NBDE Part II

Panelist feedback from the final evaluative questionnaire: NBDE Part II

<table>
<thead>
<tr>
<th>Survey Item Number and Statement</th>
<th>Mean Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The item difficulty information provided for generating the Round 3 ratings was helpful.</td>
<td>4.5</td>
</tr>
<tr>
<td>2. The instructions regarding how to use the item difficulty information were clear.</td>
<td>4.7</td>
</tr>
<tr>
<td>3. The discussion of the Round 2 Bookmark placements and instructions helped me understand what I needed to do to complete Round 3.</td>
<td>4.7</td>
</tr>
<tr>
<td>4. I am confident in my Round 3 Bookmark placement.</td>
<td>4.6</td>
</tr>
<tr>
<td>5. I had the opportunity to ask questions while working on my final recommendations.</td>
<td>4.9</td>
</tr>
<tr>
<td>6. The facilitators helped to answer questions while working on my final recommendations.</td>
<td>4.9</td>
</tr>
<tr>
<td>7. The timing and pace of the final round were appropriate.</td>
<td>4.5</td>
</tr>
<tr>
<td>8. Overall, the facilities and food service helped create a good working environment.</td>
<td>4.8</td>
</tr>
<tr>
<td>9. Overall, the materials were clear and helpful.</td>
<td>4.9</td>
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Key: Values are on a five-point scale, ranging from 1=Strongly Disagree to 5=Strongly Agree; NR = no response. All table entries are based on n=10 responses.
Panelist Feedback: NBDE Part II

Panelist feedback from the final evaluative questionnaire: NBDE Part II

<table>
<thead>
<tr>
<th>Survey Item Number and Statement</th>
<th>Mean Rating</th>
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<tbody>
<tr>
<td>10. Overall, the training in the standard setting purpose and methods was clear.</td>
<td>4.8</td>
</tr>
<tr>
<td>11. Overall, I am confident that I was able to apply the standard setting method appropriately.</td>
<td>4.8</td>
</tr>
<tr>
<td>12. Overall, the standard setting procedures allowed me to use my experience and expertise to recommend cut score for the NBDE Part II.</td>
<td>4.8</td>
</tr>
<tr>
<td>13. Overall, the facilitators helped to ensure that everyone was able to contribute to the group discussions and that no one unfairly dominated the discussions.</td>
<td>4.9</td>
</tr>
<tr>
<td>14. Overall, I was able to understand and use the information provided (e.g., other panelists’ ratings, item difficulty information).</td>
<td>4.8</td>
</tr>
<tr>
<td>15. Overall, I support the final group-recommended cut score as fairly representing the appropriate performance standard for the NBDE Part II.</td>
<td>4.9</td>
</tr>
</tbody>
</table>

Key: Values are on a five-point scale, ranging from 1=Strongly Disagree to 5=Strongly Agree; NR = no response. All table entries are based on $n=12$ responses.
** A new standard was introduced this year, based on updated standard setting activities.
The 2014 NBDE Part I standard setting panel provided a recommendation to the Joint Commission concerning the minimum passing score for the NBDE Part I. The recommendation represented an increase in the performance standard for the NBDE Part I.

In 2013, the current operational performance standard resulted in a failure rate of 6.3% for first-time test-takers from accredited dental programs. If the panel’s recommendation is applied to the same population, the resulting failure rate is 10.1%.

The recommendation from the 2014 NBDE Part I standard setting panel was approved by the Joint Commission in 2015. The new standard will be implemented no sooner than April 2016.
** A new standard was introduced this year, based on updated standard setting activities.
Standard Setting Results: NBDE Part II

• The 2014 NBDE Part II standard setting panel provided a recommendation for the Joint Commission concerning the minimum passing score for the NBDE Part II. The recommendation represented an increase in the performance standard for the NBDE Part II.

• In 2013, the current operational performance standard resulted in a failure rate of 6.3% for first-time test-takers from accredited dental programs. If the panel’s recommendation is applied to the same population, the resulting failure rate is 8.6%.

• The recommendation from the 2014 NBDE Part II standard setting panel was approved by the Joint Commission in 2015. The new standard will be implemented no sooner than April 2016.
Contact Information

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Thank you