Update on the National Board Dental Examinations (Part I, Part II, INBDE)

Dr. David M Waldschmidt
Dr. Kathleen J. Hinshaw
Dr. Chien-Lin Yang

ADEA Annual Session
San Antonio, Texas
March 17, 2014
Overview

• Purpose and Mission of the JCNDE
• Composition of the JCNDE
• Update on JCNDE Policies
• Test Administration
• Examination Scoring and Examinee Trends
• Update on the Integrated National Board Dental Examination
• Q & A
The purpose of the JCNDE is:

- to provide and conduct examinations to assist state boards in determining qualifications of dentists and dental hygienists who seek licensure.
- to make rules and regulations for the conduct of National Board examinations and certificates.
- to serve as a resource for the dental profession in the development of examinations.
“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.”
• The JCNDE oversees the following examinations:
  • National Board Dental Examination Part I
  • National Board Dental Examination Part II
  • National Board Dental Hygiene Examination (NBDHE)
• The purpose of an examination is of paramount importance; examination purpose guides all decisions.
• The purpose of the National Board Dental Examinations and the National Board Dental Hygiene Examination is to assist state boards in determining the qualifications of individuals seeking licensure to practice dentistry or dental hygiene, respectively.
# Composition of the JCNDE

## Appointing Organizations and Current Appointees

<table>
<thead>
<tr>
<th>Organization</th>
<th>Appointees</th>
<th>Chair/Verse Chair</th>
<th>Vice Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEA (3)</td>
<td>Connie L Drisko, DDS, Chair&lt;br&gt;Frank W Licari, DDS, MPH, MBA</td>
<td>Marc E Levitan, DDS</td>
<td></td>
</tr>
<tr>
<td>AADB (6)</td>
<td>LeeAnn Podruch, DDS, JD, Vice Chair&lt;br&gt;Conrad P McVea, III, DDS&lt;br&gt;David W Perkins, DMD</td>
<td>Luis J Fujimoto, DMD&lt;br&gt;Patricia Ann Parker, DMD&lt;br&gt;MH Reggie VanderVeen, DDS</td>
<td></td>
</tr>
<tr>
<td>ADA (3)</td>
<td>Robert A Hersh, DDS&lt;br&gt;Lorin D Peterson, DDS</td>
<td>Rhett L Murray, DDS</td>
<td></td>
</tr>
<tr>
<td>ADHA (1)</td>
<td>Mary Lou Gerosky, RDH, MEd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASDA (1)</td>
<td>Jiwon Lee, BS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public (1)</td>
<td>Ms. Kelley Shannon, MBA, CPA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liaisons &amp; Observers</td>
<td>Brian E. Scott, DDS (ADA Board Liaison)&lt;br&gt;Kristopher Mendoza (ASDA Observer)</td>
<td>Liaisons and observers do not participate in voting</td>
<td></td>
</tr>
</tbody>
</table>
Approved actions to help support the National Board Dental Examinations (NBDE):

- **5 Years/5 Attempts Eligibility Rule.** Candidates must pass an examination within a) five years of their first attempt or b) five examination attempts, whichever comes first. In 2013 the Joint Commission clarified that this policy applies to examination attempts occurring on or after January 1, 2012. Examination attempts occurring prior to this date are not considered under this regulation.
JCNDE Policy Updates: NBDE Actions

Approved actions to help support the National Board Dental Examinations (NBDE):

- Appointment and reappointment of NBDE Test Constructors for 2014.
- Approval of an NBDE Technical report, which provides information concerning exam development, scoring, etc.
- Permissions pertaining to released examination materials and development guides for use by dental education programs.
- Approved budgetary actions in support of examination programs (project expenditures, funding allocations).
The Joint Commission needs high quality case materials to support its examination programs. Please contribute to this effort.

For additional information:
http://www.ada.org/2287.aspx
## Test Administration Volume 2013

<table>
<thead>
<tr>
<th>Responded to requests</th>
<th>68,000+ phone calls</th>
<th>18,000+ emails, faxes, and correspondence</th>
<th>10,000+ DENTPIN issues</th>
<th>96,000 total</th>
</tr>
</thead>
</table>
| Processed applications | 8,743 NBDE Part I  
7,751 NBDE Part II | 7,234 NBDHE | 13,086 DAT  
3,765 OAT | 40,579 total |
| Processed requests for additional official reports | 35,764 NBDE Part I and Part II | 3,265 NBDHE | 11,000+ DAT  
2,400+ OAT | 74,029 total |
Test Administration and Fees

- Electronic process; 6 month eligibility. Monitor website for upcoming enhancements.
- Administered nationwide at Prometric Test Centers, any business day.
- Approximately 284 professional level testing centers in North America with 5,243 available seats.


<table>
<thead>
<tr>
<th>2014 Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBDE Part I</td>
</tr>
<tr>
<td>Official reporting to candidate and dean of accredited dental school. Candidate report is sent to the address on application.</td>
</tr>
<tr>
<td>$410</td>
</tr>
<tr>
<td>NBDE Part II</td>
</tr>
<tr>
<td>Official reporting to candidate, dean of accredited dental school, and three licensing boards if requested on application. Candidate report is sent to the address on application.</td>
</tr>
<tr>
<td>$455</td>
</tr>
<tr>
<td>Additional score report</td>
</tr>
<tr>
<td>Recipients not selected on application.</td>
</tr>
<tr>
<td>$33</td>
</tr>
<tr>
<td>Audit Request</td>
</tr>
<tr>
<td>$65</td>
</tr>
<tr>
<td>National Board Certificate with Optional Frames</td>
</tr>
<tr>
<td>Available upon successful completion of NBDE Part I and Part II.</td>
</tr>
</tbody>
</table>

http://www.ada.org/sections/educationAndCareers/pdfs/certificate_request_form.pdf
Testing Checklist

This is a summary of the most frequent issues that create problems on testing day.

<table>
<thead>
<tr>
<th>Bring two original, current (not expired) IDs to testing center:</th>
<th>Follow the instructions of the test administrator and the testing center rules.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1 government issued ID with photograph and signature (driver license or passport)</td>
<td>• Store personal items in the testing center locker and not access during testing or unscheduled break.</td>
</tr>
<tr>
<td>• 1 ID with signature (social security card, credit card, debit card, library card)</td>
<td>• No cell phone use during testing or unscheduled break.</td>
</tr>
<tr>
<td><strong>Name on IDs match the name submitted on application exactly.</strong></td>
<td>• Check pockets to ensure they are empty.</td>
</tr>
<tr>
<td>• <strong>Match:</strong> Joseph Anthony Smith and Joseph A. Smith</td>
<td><strong>Problem with testing conditions; notify the test administrator immediately.</strong></td>
</tr>
<tr>
<td>• <strong>Non-match:</strong> Joseph Anthony Smith and Joseph Smith-Johnson (hyphenated last names)</td>
<td>Concerns not resolved must be submitted in writing to JCNDE within 5 business days of testing appointment.</td>
</tr>
</tbody>
</table>
## Test Administration Schedule

### National Board Dental Examination Part I

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional Tutorial</td>
<td>15 minutes</td>
</tr>
<tr>
<td><strong>Discipline-based, multiple-choice test items with 3-5 testlets</strong> (approximately 200 items)</td>
<td>3.5 hours</td>
</tr>
<tr>
<td>Optional scheduled break</td>
<td>One hour (maximum)</td>
</tr>
<tr>
<td><strong>Discipline-based, multiple choice test items with 3-5 testlets</strong> (approximately 200 items)</td>
<td>3.5 hours</td>
</tr>
<tr>
<td>Optional Post-examination Survey</td>
<td>15 minutes</td>
</tr>
<tr>
<td><strong>Total Time</strong></td>
<td>8 hours 30 minutes</td>
</tr>
</tbody>
</table>

### National Board Dental Examination Part II

#### Day 1

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional Tutorial</td>
<td>15 minutes</td>
</tr>
<tr>
<td><strong>Discipline-based, multiple choice test items</strong> (200 items)</td>
<td>3.5 hours</td>
</tr>
<tr>
<td>Optional Scheduled Break</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Discipline-based, multiple choice test items</strong> (200 items)</td>
<td>3.5 hours</td>
</tr>
</tbody>
</table>

#### Day 2

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional Tutorial</td>
<td>15 minutes</td>
</tr>
<tr>
<td><strong>Patient Case Problems</strong> (100 case-based items)</td>
<td>3.5 hours</td>
</tr>
<tr>
<td>Optional Post-examination Survey</td>
<td>15 minutes</td>
</tr>
<tr>
<td><strong>Total Time</strong></td>
<td>12 hours 15 minutes</td>
</tr>
</tbody>
</table>
Testing Accommodations

Testing accommodations are granted in compliance with the Americans with Disabilities Act upon submission of:

<table>
<thead>
<tr>
<th><strong>Testing Accommodation Request Form</strong> describes disorder/disability and need for accommodations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodations must align with the functional limitation (behavioral manifestation of disability that impedes individual’s ability to function) so accommodation is applicable to impairment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Current evaluation report</strong> (within the past five years) from licensed professional.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Must be on official letterhead with professional’s credentials, signature, address, and telephone number with examinee’s name, date of birth, and date of evaluation. The report must include:</td>
</tr>
</tbody>
</table>

- **Diagnostic procedures/tests** administered. Diagnostic methods should be appropriate to disorder and aligned with current professional protocol.

- **Results of diagnostic procedures/tests** and comprehensive interpretation of results.

- **Diagnosis of disorder/disability**, with an accompanying description of limitations.

- **Recommendations for specific accommodations** and how they will reduce the impact of functional limitation.

<table>
<thead>
<tr>
<th><strong>Documentation of any previous accommodations</strong> provided by educational institutions/testing agencies.</th>
</tr>
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<tbody>
<tr>
<td>If no prior accommodations were provided, the licensed professional should include explanation as to why no accommodations were given in the past and why accommodations are needed now.</td>
</tr>
</tbody>
</table>
Testing accommodations provided by Prometric.
(Data represents 4 of the 5 testing programs conducted by DTS)
Prometric Test Center Hardware Specifications

• Dell Optiplex 745/HP DC5100 or better
• 1 GB RAM upgrading to 1.5 GB by June 2014
• 1 GB network interface card
• On-board sound card
• Windows XP Professional operating system with Service Pack 1 upgrading to Window 7 with Service Pack 1 by June 2014
• Internet Explorer 7 upgrading to Internet Explorer 9/10 by June 2014
• U.S. international keyboard
• HP 17” LCD high resolution monitor
Examination Volumes

Part I Monthly Volumes

<table>
<thead>
<tr>
<th>Month</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
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<td>February</td>
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<td>May</td>
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<td>August</td>
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<td>September</td>
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<td>October</td>
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<td>November</td>
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<tr>
<td>December</td>
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</tr>
</tbody>
</table>
Examination Volumes

Part II Monthly Volumes

January February March April May June July August September October November December

2008 2009 2010 2011 2012 2013
To improve rescheduling process including last minute reschedules, a new reschedule policy was adopted in 2013.

Candidates contact Prometric directly and pay a fee to reschedule.

Contractual agreements require JCNDE payment for no-shows.

**Fee Schedule**

(Saturday and Sunday are NOT business days)

<table>
<thead>
<tr>
<th>Fee</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100</td>
<td>the day before to 5 business days prior to the testing appointment</td>
</tr>
<tr>
<td>$60</td>
<td>6 to 30 business days prior to the testing appointment</td>
</tr>
<tr>
<td>$25</td>
<td>31+ business days prior to the testing appointment</td>
</tr>
</tbody>
</table>
## Reschedule and No-Show Volume

<table>
<thead>
<tr>
<th></th>
<th>NBDE I</th>
<th></th>
<th>NBDE II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reschedule</td>
<td>No-Show</td>
<td>Reschedule</td>
<td>No-Show</td>
</tr>
<tr>
<td>2012</td>
<td>4,374</td>
<td>296</td>
<td>2,888</td>
<td>112</td>
</tr>
<tr>
<td>2013</td>
<td>3,268</td>
<td>250</td>
<td>2,750</td>
<td>193</td>
</tr>
<tr>
<td>Total</td>
<td><strong>7,642</strong></td>
<td><strong>546</strong></td>
<td><strong>5,638</strong></td>
<td><strong>305</strong></td>
</tr>
</tbody>
</table>

### Reschedule/No-Show Volume

- **NBDE Part I**
- **NBDE Part II**

- 2012 Reschedule: 4,374
- 2013 Reschedule: 3,268
- 2012 No Show: 296
- 2013 No Show: 250

- **NBDE Part I**
- **NBDE Part II**

- Total Reschedule: 7,642
- Total No Show: 546
- Total Reschedule: 5,638
- Total No Show: 305
# Official Reports/Scoring

<table>
<thead>
<tr>
<th><strong>Official Reports</strong></th>
<th><strong>Scoring</strong></th>
</tr>
</thead>
</table>
| NBDE results reported as pass/fail.  
For remediation purposes, failing candidates receive numerical scores for each of the major disciplines covered on the test.  
If candidate tested prior to 2012, numerical scores for prior attempts will be reported. | Candidate score is computed by the total number of correct answers selected. Total score is then converted to a scale score, which adjusts for any minor differences in difficulty across forms.  
Scale scores range from 49 to 99, with 75 representing the minimum passing score (regardless of test form).  
The NBDE is a criterion-referenced examination, and the minimum passing score is determined by experts through standard setting activities. |
| Official reports are mailed approximately three weeks after testing.  
JCNDE regulations prohibit reporting results by telephone, fax, email, or in person. | Detailed score analysis provided in NBDE Technical Report. |
## Retesting

<table>
<thead>
<tr>
<th>90-day wait required between retests.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candidates who have passed NBDE Part I or Part II may not retest unless required by a state board or relevant regulatory agency.</td>
</tr>
</tbody>
</table>

Candidates who have not passed after three attempts are required to wait 12 months after their third attempt before retesting.

After the 12-month waiting period has lapsed, a new cycle applies. Candidates are encouraged to seek formal remediation before reexamination.

Candidates must pass the examination within five years of their first attempt or five examination attempts, whichever comes first.

Applies to examination attempts on or after January 1, 2012.
Testing Irregularities and Appeals

**Definition of Irregularity**: there is a question about the validity of test results accurately reflecting the ability/skills of candidate.

Reasons for withholding scores include, but are not limited to:

- Unusual answer patterns.
- Atypical score increases from one testing attempt to another.
- Inconsistent performance on different parts of test.
- Improper access to secure test content.
- Test administration irregularity.
- Falsification of personal identification, application information/supporting documents.
- Violation of rules/regulations.
- Falsification of official report.
- Information indicating the results may not be valid.

**Irregularity detection and investigation:**

- Testing vendor Irregularity reports or miscellaneous source (e.g., anonymous tips, routine audit procedures).
- Conduct investigation.
- Take action (e.g. withhold score/retest restriction)

**Notification/Appeal Process**

- Candidate notified; 30 days to submit appeal.
- Appeal forwarded to Chair.
- Chair grants/denies/or forwards appeal to JCNDE for ballot.
- Candidate notified of decision.
## Post Test Survey
### Satisfaction with Testing Experience - Prometric

### NBDE Part I

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>Very Satisfied</th>
<th>Satisfied</th>
<th>Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appointment date</td>
<td>8308</td>
<td>52.5</td>
<td>44.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Promptness in seating the candidate</td>
<td>8266</td>
<td>67.3</td>
<td>29.2</td>
<td>3.5</td>
</tr>
<tr>
<td>Helpfulness of test center staff</td>
<td>8225</td>
<td>71.3</td>
<td>27.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Performance of testing system</td>
<td>8190</td>
<td>54.1</td>
<td>42.5</td>
<td>3.4</td>
</tr>
<tr>
<td>Test center total testing environment</td>
<td>8171</td>
<td>51.5</td>
<td>44.3</td>
<td>4.2</td>
</tr>
<tr>
<td>Total experience of taking NBDE Part I</td>
<td>81.4</td>
<td>49.8</td>
<td>47.7</td>
<td>2.5</td>
</tr>
</tbody>
</table>

### NBDE Part II

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>Very Satisfied</th>
<th>Satisfied</th>
<th>Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appointment date</td>
<td>7224</td>
<td>55.6</td>
<td>41.5</td>
<td>2.9</td>
</tr>
<tr>
<td>Promptness in seating them</td>
<td>7192</td>
<td>66.7</td>
<td>29.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Helpfulness of test center staff</td>
<td>7172</td>
<td>72.1</td>
<td>26.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Performance of testing system</td>
<td>7143</td>
<td>55.1</td>
<td>40.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Test center total testing environment</td>
<td>7137</td>
<td>55.4</td>
<td>41.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Total experience of taking NBDE Part II</td>
<td>7113</td>
<td>54.4</td>
<td>43.0</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Infrastructure Improvements

New item bank vendor (Zoomorphix)
• Multi-year project - provided more powerful and user friendly item bank.

New software infrastructure platform (Aptify)
• Previous platform, SAS (DOS based).
• Migration included 15+ programs, and 30+ years of historical data.
• Permits one single platform and one standard interface.
• Creates “person record”; historical record of all DTS transactions by candidate.
• Long and arduous project (7 years), but created a standardization and continuity not previously available.

Website updates and e-business
• More user friendly experience and aligns with www.ADA.org website redesign, improves experience for smartphones/tablets.
• Redesign of the transactional components (applications, score report requests, documents, etc.). New payment vendor - PayPal. Scheduled to be completed 4th quarter of 2014.
<table>
<thead>
<tr>
<th>What?</th>
<th>Where?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Counseling</td>
<td>Your academic institution and dental school.</td>
</tr>
</tbody>
</table>
| Guides                      | [http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_examinee_guide.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_examinee_guide.pdf)  
  [http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_examinee_guide.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_examinee_guide.pdf) |
| FAQs                        | [http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_faq.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_faq.pdf)  
  [http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_faq.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_faq.pdf) |
| Checklist                   | [http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_checklist.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_checklist.pdf)  
  [http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_checklist.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_checklist.pdf) |
| Application Instructions    | [http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_app_instructions.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_app_instructions.pdf)  
  [http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_app_instructions.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_app_instructions.pdf) |
| Testing Accommodations      | [http://www.ada.org/sections/educationAndCareers/pdfs/nb_accommodation_request.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nb_accommodation_request.pdf) |
| Tutorial                    | [https://www.prometric.com/ClientFiles/ada/NB1/index.htm](https://www.prometric.com/ClientFiles/ada/NB1/index.htm)  
  [https://www.prometric.com/ClientFiles/ada/NB2/index.htm](https://www.prometric.com/ClientFiles/ada/NB2/index.htm) |
| Website                     | [http://www.ada.org/2287.asp](http://www.ada.org/2287.asp)  
  [http://www.ada.org/2288.aspx](http://www.ada.org/2288.aspx) |
| Released Item Sets          | [http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_sample_test.pdf](http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_sample_test.pdf)  
  [www.asdanet.org](http://www.asdanet.org) |
| Prometric FAQs              | [https://www.prometric.com/en-us/for-test-takers/Prepare-for-Test-Day/frequently-asked-questions/Pages/default.aspx](https://www.prometric.com/en-us/for-test-takers/Prepare-for-Test-Day/frequently-asked-questions/Pages/default.aspx) |
| What to Expect on Test Day  | [https://www.prometric.com/en-us/for-test-takers/Prepare-for-Test-Day/Pages/what-to-expect.aspx](https://www.prometric.com/en-us/for-test-takers/Prepare-for-Test-Day/Pages/what-to-expect.aspx)  
| Licensure Overview         | [http://www.ada.org/489.aspx](http://www.ada.org/489.aspx) |
Website

http://www.ada.org/JCNDE.aspx
Please note: updates to the website are scheduled for April. The graphics may be different when you access the website.

Step 1: Read the Guide
Step 2: Retrieve your DENTPIN® and Apply to take the Examination
Step 3: Schedule a Time to Take the Examination
Step 4: Take the Examination at a Prometric Test Center
Step 5: Score Reports

http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_examinee_guide.pdf

http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_examinee_guide.pdf
Additional Resources

http://www.ada.org/2287.asp
http://www.ada.org/2288.aspx

- Case Materials
- JCNDE Actions
- Meeting Presentations
- Newsletters
- Reference Texts
- Technical Report (detailed scoring information)
- Test Item Development Guide
Joint Commission on National Dental Examinations
211 E. Chicago Avenue, Suite 600
Chicago, Illinois 60611
800-232-1694
nbexams@ada.org

Kathleen J. Hinshaw, L.D.H., Ed.D.
Senior Manager, Test Administration
hinshawk@ada.org
312.440.2680
Overview

• Scoring of the NBDE
• Trends in NBDE Administration Volume
• Trends in NBDE Failure Rates
• Standard Setting for Part I and Part II
A candidate’s total score is computed based on the total number of correct answers selected by the candidate. The total score is then converted to a scale score, which adjusts for any minor differences in difficulty across NBDE Part I and II forms.
Item Response Theory (IRT)

- Item Response Theory (IRT)
  - Used to score examinations and estimate candidate knowledge/skill levels.
  - Relies on statistical techniques to model the association between an examinee’s responses to test items and the underlying latent trait (e.g., dental skills) measured by the items.
  - As the trait level increases, the probability of a correct response to an item increases.
  - The accuracy of a test score (i.e., the estimation of examinee underlying ability) depends on how well the IRT model describes this association and fits the data.
Item Response Theory

- The mathematical models developed in IRT emphasize that an examinee’s probability of answering a given item correctly depends on the examinee’s ability and the characteristics of the item.

- The three most popular unidimensional IRT models are the
  * one-parameter logistic (1PL) model
    The 1PL model is currently being used by the Joint Commission
  * two-parameter logistic (2PL) model
  * three-parameter logistic (3PL) model.

- These three models are appropriate for dichotomous item response data (a score of 1 represents a correct response and a score of 0 represents an incorrect response).
One-Parameter Logistic (1PL) Model

\[ P_i(\theta) \equiv P_i(X_i = 1/\theta) = \frac{e^{(\theta - b_i)}}{1 + e^{(\theta - b_i)}} \quad i = 1, 2, \ldots, n \]

- This equation shows the probability of answering an item correctly \((P_i(\theta))\) under the 1PL Model.

- The 1PL model assumes that item difficulty \((b_i)\) is the only item characteristic influencing examinee performance.

- The probability of a correct response \((P_i(\theta))\) equals 50% when the examinee ability \((\theta)\) matches the item’s difficulty.
The two-parameter model is an extension of the one-parameter model that uses item discrimination ($a_i$) and the item difficulty ($b_i$) parameters to describe each test item.

- Items that are more discriminating (i.e., higher $a_i$ values) are more useful for accurately estimating examinee ability levels.

- Both 1PL and 2PL models assume that $P_i(\theta)$ approaches 0 for an examinee with very low ability.
Three-Parameter Logistic (3PL) Model

\[ P_i (\theta) = C_i + (1 - C_i) \frac{e^{D a_i (\theta-b_i)}}{1+e^{D a_i (\theta-b_i)}} \quad i = 1, 2 \ldots, n \]

- In addition to item discrimination \((a_i)\) and item difficulty \((b_i)\), the 3PL model takes guessing \((c_i)\) into account. The model acknowledges that it is possible for an examinee to guess the correct answer to an item, even if the examinee does not have enough ability to understand the concepts being assessed by the item.

- Theoretically, the guessing parameter ranges from 0.0 to 1.0 (0% to 100%), but it is typically less than 0.30 (30%) for standard multiple choice questions.
Number Correct | Standard Score
--- | ---
0 | 49
400 | 99

Conversion process

75 (p/f point)
Number Correct vs. Standard Score

Conversion Process

Number Correct:
- 500

Standard Score:
- 99
- 49
- 75 (p/f point)
## Score Conversion Tables

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<tr>
<th># Correct</th>
<th>Form A Status</th>
<th>Form B Status</th>
<th>Form C Status</th>
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<tr>
<td>1</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>2</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>3</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>4</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>5</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
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<tr>
<td>6</td>
<td>Fail</td>
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<td>7</td>
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<td>Fail</td>
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<tr>
<td>8</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
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<tr>
<td>9</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>10</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>11</td>
<td>Pass</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>12</td>
<td>Pass</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>13</td>
<td>Pass</td>
<td>Pass</td>
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<tr>
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</tr>
<tr>
<td>15</td>
<td>Pass</td>
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<td>Pass</td>
</tr>
</tbody>
</table>

- Fail Forms A, B, and C
- Pass Form A, Fail Forms B and C
- Pass Forms A and B, Fail Form C
- Pass Forms A, B, and C
Figure 1. NBDE Part I Administrations (2004 - 2013)
** A new standard was introduced this year, based on updated standard setting activities.
Figure 2. NBDE Part II Administrations (2004 - 2013)
** A new standard was introduced this year, based on updated standard setting activities.
2014 Research and Development Activities

- Standard Setting for Part I and Part II of the National Board Dental Examination.
  
  - Standard setting activities are used to set the cut score that separates passing and failing candidates for the high-stakes national dental board examinations.
  
  - The identification of a cut score represents a collective judgment by subject matter experts that those who fall below a particular skill level (as represented by the cut score) have an unacceptably high likelihood of making serious errors in the practice of dentistry.
  
  - The Joint Commission periodically conducts standard-setting activities to ensure the appropriateness of the minimum passing score for the National Board Dental Examinations.
2014 Research and Development Activities

- These activities have not only established the cut score for future administrations, but have also historically provided support for cut scores that are currently in use.

- The current cut scores for Part I and Part II of the National Board Dental Examinations were identified through standard-setting activities conducted in October of 2007 and 2008, respectively.

- New standards based on these activities were introduced for Part I and Part II in 2008 and 2009, respectively.
Given the Joint Commission’s focus on producing state of the art examinations and the critical role NBDE and NBDHE cut scores play with regard to public health outcomes, a standard setting activity proposal was requested from Dr. Gregory Cizek to set new cut scores for the NBDE Parts I and II in 2014.

Dr. Cizek is a nationally recognized expert on standard setting procedures who has authored numerous papers and several books on the subject.

Dr. Cizek is currently serving as a consultant to the Joint Commission on the INBDE.
Joint Commission on National Dental Examinations
211 E. Chicago Avenue, Suite 600
Chicago, Illinois 60611
800-232-1694
nbexams@ada.org

Chien-Lin Yang, Ph.D.
Manager, Research and Development/Psychometrics
yangc@ada.org
312.440.2682
What is the INBDE?

• In 2009, the JCNDE appointed a Committee for an Integrated Examination (CIE) to develop and validate a new examination instrument for dentistry that integrates basic, behavioral, and clinical sciences to assess entry level competency in dental practice, to supplant Part I and Part II.

• The Integrated National Board Dental Examination retains the same fundamental examination purpose as Part I and Part II: to assist state boards of dentistry in determining qualifications of dentists who seek licensure to practice in the US.
Approved a report outlining development of the content domain for the INBDE, including corresponding efforts to solicit and incorporate feedback from stakeholders and communities of interest. This report specified a Model of the Domain of Dentistry, including clinical competencies performed by entry level dentists and foundation knowledge areas required to successfully demonstrate those competencies. The following four deliverables were approved:

- Model of the Domain of Dentistry
- Statements and annotations underpinning the Foundation Knowledge for the General Dentist
- The percentage of items to be devoted to the ten Foundation Knowledge areas assessed by the INBDE
- The percentage of items to be devoted to the three clinical component sections appearing within the INBDE

The approved materials can be viewed in the INBDE section of the Joint Commission’s website (www.ada.org/jcnde.aspx).
Model of the Domain of Dentistry

Foundation Knowledge for The General Dentist

FK1 Apply knowledge of molecular, biochemical, cellular, and systems-level development, structure and function to the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

FK2 Apply knowledge of physics and chemistry to explain normal biology and pathobiology in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

FK3 Apply knowledge of physics and chemistry to explain the characteristics and use of technologies and materials used in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

Domain of Dentistry: Component Sections

Diagnosis and Treatment Planning

1. Obtain and interpret patient/medical data, including a thorough intra/extra oral examination, and use these findings to accurately assess and manage all patients.
2. Identify patient's chief complaints.
3. Obtain medical, dental, psychosocial, and behavioral histories.
4. Perform head and neck and intraoral examinations.
5. Obtain medical and dental consultations when appropriate.
6. Use clinical and epidemiological data to diagnose and establish a prognosis for dental abnormalities and pathology.
7. Recognize the normal range of clinical findings and significant deviations that require monitoring, treatment, or management.
8. Select, obtain and interpret diagnostic images for the individual patient.
9. Recognize the manifestations of systemic disease and how the disease and its management may affect the delivery of dental care.
10. Formulate a comprehensive diagnosis, treatment and/or referral plan for the management of patients.
11. Discuss etiologies, treatment alternatives, and prognoses with patients and educate them so they can participate in the management of their own care.
Model of the Domain of Dentistry

**FK4** Apply knowledge of the principles of genetic, congenital and developmental diseases and conditions and their clinical features to understand patient risk in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

**FK5** Apply knowledge of the cellular and molecular bases of immune and non-immune host defense mechanisms in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

**FK6** Apply knowledge of general and disease-specific pathology to assess patient risk in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

---

**Oral Health Management**

1. Manage patients in a hospital setting.
2. Manage the unique needs relating to the oral health care of infants.
3. Manage the unique needs relating to the oral health care of children.
4. Manage the unique needs relating to the oral health care of adolescents.
5. Manage the oral health care of adults, including the unique needs of women.
6. Manage the unique needs relating to the oral health care of geriatric patients.
7. Manage the unique needs relating to the oral health care of special needs patients.
8. Select and administer or prescribe pharmacological agents in the treatment of dental patients.
9. Anticipate, prevent, and manage complications arising from the use of therapeutic and pharmacological agents employed in patient care.
11. Prevent, diagnose and manage temporomandibular disorders.
12. Diagnose and manage periodontal diseases.
14. Maintain function and promote soft and hard tissue health.
15. Manage patients with oral esthetic needs.
16. Diagnose and manage developmental or acquired occlusal abnormalities.
17. Manage the replacement of teeth for the partially or completely edentulous patient.
18. Restore partial or complete edentulism with uncomplicated fixed or removable prosthetic restorations.
19. Manage the restoration of partial or complete edentulism using implant procedures.
20. Diagnose and manage pulpal and periradicular diseases.
22. Diagnose and manage oral surgical treatment needs.
23. Perform uncomplicated oral surgical procedures.
24. Manage patients requiring modification of oral tissues to optimize restoration of form, function and esthetics.
25. Prevent, recognize and manage medical and dental emergencies.
26. Perform basic cardiac life support.
27. Recognize and manage acute pain, hemorrhage, trauma, and infection of the orofacial complex.
28. Recognize and manage patient abuse and/or neglect.
29. Recognize and manage substance abuse.
30. Evaluate outcomes of comprehensive dental care.
31. Diagnose and manage oral mucosal and osseous diseases.
Model of the Domain of Dentistry

**FK7** Apply knowledge of the biology of microorganisms in physiology and pathology in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

**FK8** Apply knowledge of pharmacology in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

**FK9** Apply knowledge of sociology, psychology, ethics and other behavioral sciences in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

**FK10** Apply quantitative knowledge, critical thinking, and informatics tools in the prevention, diagnosis, and management of oral disease and the promotion and maintenance of oral health.

**Practice and Profession**

1. Evaluate emerging trends in health care and integrate new medical knowledge and therapies relevant to oral health care.
2. Evaluate social and economic trends and their impacts on oral health care.
3. Utilize critical thinking and problem-solving skills.
4. Evaluate scientific literature and integrate best research outcomes with patient values and other sources of information to make decisions about dental treatment.
5. Apply advances in modern biology to clinical practice.
6. Apply principles of ethics and jurisprudence to the practice of dentistry.
7. Practice within one’s scope of competence and consult with or refer to professional colleagues when indicated.
8. Apply appropriate interpersonal and communication skills.
9. Apply psychosocial and behavioral principles in patient-centered care.
10. Communicate effectively with individuals from diverse populations.
11. Apply prevention, intervention and educational strategies to maximize oral health.
12. Participate with dental team members and other health care professionals in health promotion and disease management for individuals and communities.
13. Evaluate and apply contemporary clinical, laboratory and information technology resources in patient care, practice management and professional development.
14. Evaluate different models of oral health care management and delivery.
15. Apply principles of risk management, including informed consent and appropriate record-keeping in patient care.
16. Use effective business and financial management skills.
17. Use effective human resource management skills to coordinate and supervise the activity of allied dental health personnel.
18. Apply quality assurance, assessment and improvement concepts.
19. Assess one’s personal level of skills and knowledge relative to dental practice.
20. Understand and apply local, state and federal laws and regulations pertaining to dentistry and healthcare, including OSHA and HIPAA.
21. Develop a catastrophe preparedness plan for the dental practice.
22. Utilize universal infection control guidelines for all clinical procedures.
23. Communicate case design with laboratory technicians and evaluate the resultant restoration/prosthesis.
Percentage of Items (300 items)
Percentage of Items (450 items)

- 34.00%: Diagnosis and Treatment Planning
- 26.90%: Oral Health Management
- 39.10%: Practice and Profession

Each sector in the pie chart represents a different category:
- FK1: 17%
- FK2: 12%
- FK3: 10%
- FK4: 9%
- FK5: 11%
- FK6: 6%
- FK7: 12%
- FK8: 5%
- FK9: 12%
Approved a number of resolutions to enhance communication and alignment between the Joint Commission and the CIE. This included the following:

- **Current Chairs of Joint Commission NBDE standing committees (Administration, Examination Development, Research and Development)—or their designee from the standing committee—will serve as ex-officio members of the CIE with all the rights, responsibilities, and duties of other members of the CIE, including the right to vote.**

- **The Chair of the CIE will attend the Joint Commission meeting and, as appropriate, Joint Commission subcommittee meetings.**
The original members of the CIE are all well acquainted with the mission and workings of the Joint Commission.

<table>
<thead>
<tr>
<th>Name</th>
<th>Roles and Years</th>
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<tbody>
<tr>
<td>Mark Christensen, DDS (Chair)</td>
<td>(AADB 2006-2009)</td>
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<td></td>
<td>Vice-Chair – JCNDE (2009)</td>
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<td>Chair - Administration (2008)</td>
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<tr>
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<td>Chair – Dental Hygiene (2006 &amp; 2007)</td>
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<tr>
<td>Andrew Spielman, DMD, MS, Ph.D.</td>
<td>(ADEA 2008-2011)</td>
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<tr>
<td>Bruce D. Horn, DDS</td>
<td>(AADB 2007-2010)</td>
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<td>Ron J. Seeley, DDS</td>
<td>(ADA 2007-2010)</td>
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<td>Chair - Examination Development (2008)</td>
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<td>B. Ellen Byrne, DDS, Ph.D.</td>
<td>(ADEA 2009-2012)</td>
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<td>Stephen T. Radack, III, DMD</td>
<td>(ADA 2008-2011)</td>
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<td>Vice-Chair - JCNDE (2010)</td>
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</tbody>
</table>
Committee for an Integrated Examination

Joint Commissioners Serving as Ex-Officio CIE Members (2014)

The Joint Commission Chair and Standing Committee Chairs serve as ex-officio members of the CIE.

Connie Drisko, DDS  
Chair – JCNDE (2014)  
Chair – Examination Development (2013)

LeeAnn Podruch, DDS, JD  
Vice-Chair – JCNDE (2014)  
Chair – Research & Development (2014)

Robert A. Hersh, DDS  
Chair – Administration (2014)

Marc E. Levitan, DDS  
Chair – Examination Development (2014)
JCNDE Policy Updates: INBDE Actions

• Approved resolutions to enhance Joint Commission communications with stakeholders and communities of interest (presentations, website updates, enhanced orientation for new members of the Joint Commission).

• Affirmed that the Joint Commission will provide stakeholders and communities of interest with at least four years’ notice prior to the full implementation of the INBDE.
Current INBDE Deliverables under Consideration by the Joint Commission:

- Clarification of the Concepts of Integration, Clinical Relevance, and Examination Purpose
- Item Presentation Considerations Involving Content
- Language Conventions
- Administration Conditions
- Item Writing Standards
- Item Content Standards
- Item Writing/Review Process
- Item Classification/Tagging Approach
- Field Testing Approach
In building the INBDE, the CIE’s attention has been drawn to three central concepts:

- Examination Purpose
- Clinical Relevance
- Integration

The slides that follow present a perspective on these three concepts that the Joint Commission will be considering at its April 2014 meeting.
Examination Purpose

The INBDE is a written examination, exclusive of clinical demonstrations, for the purpose of assisting state boards in determining qualifications of dentists who seek licensure to practice in any state, district or dependency of the United States, which recognizes the National Board Dental Examinations.
Clinical Relevance within the context of the INBDE

Clinical Relevance refers to factors that impact patient outcomes in clinical/professional contexts. This includes all aspects of patient care and also encompasses considerations involving how dentists approach the practice of dentistry (Practice Relevance), and keep up with the profession and advances that impact the profession (Professional Relevance).
Clinical Relevance within the context of the INBDE (continued)

Broadly speaking, for the INBDE Clinical Relevance involves the actual experiences of entry-level, general dentists, practicing independently, as they work to improve patient outcomes. Clinical relevance is maximized in the INBDE when there is a strong degree of fidelity between the content of examination items, the knowledge and cognitive skills required to answer those items, and the actual experiences of entry-level, practicing general dentists.
Integration

Integration brings to bear knowledge of basic, clinical, and/or behavioral sciences along with cognitive skills to understand and solve problems in clinical/professional contexts.

The INBDE requires examinees to bring to bear basic and/or behavioral science knowledge and cognitive skills in clinical/professional contexts in a way that informs the licensure decision for safe, independent, entry-level competency in the general practice of dentistry.
The relationship among these 3 key concepts:

- Clinical relevance and alignment with test purpose are the key considerations in establishing content and the items that will appear on the examination.
- Integration is viewed as a means of implementing and promoting this perspective; as such, integration is secondary to clinical relevance and alignment with test purpose.
- In summary, examination purpose drives all considerations, clinical relevance is the best way to achieve the exam purpose, and integration provides a strong means of achieving clinical relevance.
Please visit the Joint Commission’s website to learn more about the INBDE. The Joint Commission meets on April 9, 2014, and will be making a number of important decisions that set the direction with respect to further INBDE development.
Joint Commission on National Dental Examinations
http://www.ada.org/JCNDE.aspx

Integrated National Board Dental Examination
http://www.ada.org/5553.aspx

National Boards (Examination Guides, FAQ’s, DENTPIN® Information, Score Report Requests)
  Part I: http://www.ada.org/2667.aspx
  Part II: http://www.ada.org/2665.aspx
Dental Hygiene: http://www.ada.org/2662.aspx

Test Construction Committee Information
http://www.ada.org/2291.aspx

Technical Reports, ADEA Presentations, Item Development Guides
http://www.ada.org/2287.aspx
Contact Information

David M. Waldschmidt, Ph.D.
Director, Department of Testing Services
waldschmidtd@ada.org

Kathleen J. Hinshaw, L.D.H., Ed.D.
Senior Manager, Test Administration
hinshawk@ada.org

Cathryn Albrecht, Esq.
Senior Associate General Counsel
albrechtc@ada.org
312.440.7466

Chien-Lin Yang, Ph.D.
Manager, Research and Development/Psychometrics
yangc@ada.org

Christina Crumlish
Coordinator, Department of Testing Services
crumlishc@ada.org
312.440.2676

Ellen J. Ryske, MBA, PMP
Manager, Client Services/Special Projects
ryskee@ada.org

Open
Manager, Test Development
Q & A