The Integrated National Board Dental Examination (INBDE)

Dr. David M. Waldschmidt
Secretary, JCNDE
Overview and Agenda

• The JCNDE and its mission.
• Overview of the Integrated National Board Dental Examination (INBDE) and the rationale behind pursuing an integrated examination.
• Overview of the test development process and the work conducted to build a valid and reliable high stakes examination.
• INBDE item writing efforts and examples.
• Questions
An Important Note

The INBDE is currently under development. As such, the specific details associated with this examination program are evolving and will change over time. Information shared in this presentation should be regarded as tentative and based on preliminary program requirements and the best available information as of the date of this presentation.
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.”
<table>
<thead>
<tr>
<th>Appointing Organizations and Current Appointees</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADA (3)</strong></td>
</tr>
<tr>
<td>Robert A Hersh, DDS, Chair</td>
</tr>
<tr>
<td>Rhett L Murray, DDS</td>
</tr>
<tr>
<td>Lisa Heinrich-Null, DDS</td>
</tr>
<tr>
<td><strong>AADB (6)</strong></td>
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<tr>
<td>MH Reggie VanderVeen, DDS Vice Chair</td>
</tr>
<tr>
<td>Luis J Fujimoto, DMD</td>
</tr>
<tr>
<td>Patricia Ann Parker, DMD</td>
</tr>
<tr>
<td>Dale R Chamberlain, DDS</td>
</tr>
<tr>
<td>Conrad P McVea, III, DDS</td>
</tr>
<tr>
<td>David W Perkins, DMD</td>
</tr>
<tr>
<td><strong>ADEA (3)</strong></td>
</tr>
<tr>
<td>Marc E Levitan, DDS</td>
</tr>
<tr>
<td>Nader Nadershahi, DDS, MBA, EdD</td>
</tr>
<tr>
<td>Frank W Licari, DDS, MPH, MBA</td>
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<tr>
<td><strong>ADHA (1)</strong></td>
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<tr>
<td>Melissa G Efurd, RDH, Ed.D</td>
</tr>
<tr>
<td><strong>ASDA (1)</strong></td>
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<tr>
<td>Kristopher Mendoza</td>
</tr>
<tr>
<td><strong>Public (1)</strong></td>
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<tr>
<td>Issie L. Shelton-Jenkins, Esq.</td>
</tr>
<tr>
<td><strong>Liaisons &amp; Observers</strong></td>
</tr>
<tr>
<td>Robert N. Bitter, DMD (ADA Board Liaison)</td>
</tr>
<tr>
<td>Greg P. Shank (ASDA Observer)</td>
</tr>
<tr>
<td>Liaisons and observers do not participate in voting</td>
</tr>
</tbody>
</table>
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 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.
How did the CIE and INBDE come about?

- A convergence of factors led to the INBDE, all intent upon finding better ways of serving communities of interest.
- Specific opportunities were seen to:
  - Increase the appropriateness of test content and align content with contemporary dental education
  - Improve processes and the experience of candidates
  - Better assist regulatory agencies
- There was also recognition of examination content trends and a movement towards integration and clinical relevance.
<table>
<thead>
<tr>
<th>Year</th>
<th>Key Tasks and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>ADEA Commission on Change and Innovation (CCI) in Dental Education recommends changes to dental education and assessment.</td>
</tr>
<tr>
<td>2006-2007</td>
<td>JCNDE monitors and considers CCI progress and recommendations.</td>
</tr>
<tr>
<td>2008</td>
<td>JCNDE creates ad hoc Committee on Strategic Planning, conducts environmental scans, considers the future.</td>
</tr>
<tr>
<td>2009</td>
<td>JCNDE resolves to create an integrated examination, appoints members to the ad hoc Committee for an Integrated Examination (CIE).</td>
</tr>
<tr>
<td>2010</td>
<td>CIE works to lay the content foundation for the exam.</td>
</tr>
<tr>
<td>2011</td>
<td>Practice analysis and science panels conducted using content foundation.</td>
</tr>
<tr>
<td>2012</td>
<td>Development of general test specifications.</td>
</tr>
<tr>
<td>2013</td>
<td>Solidification of many details concerning item development and approach. Resolutions to enhance communication and alignment between Joint Commission and CIE.</td>
</tr>
<tr>
<td>2014</td>
<td>Refinement of approach. First INBDE TCCs formed. Item writing begins.</td>
</tr>
</tbody>
</table>
Committee for an Integrated Examination (ad hoc)

The original members of the CIE are all well acquainted with the mission and workings of the Joint Commission.

Mark Christensen, DDS (Chair)
(AADB 2006-2009)
Vice-Chair – JCNDE (2009)
Chair - Administration (2008)
Chair – Dental Hygiene (2006 & 2007)

Andrew Spielman, DMD, MS, Ph.D.
(ADEA 2008-2011)
Chair – JCNDE (2011)
Chair – Examination Development (2009)

Bruce D. Horn, DDS
(AADB 2007-2010)
Chair – JCNDE (2010)
Chair – Administration (2009)
Chair – Dental Hygiene (2008)

Ron J. Seeley, DDS
(ADA 2007-2010)
Chair – JCNDE (2009)
Chair - Examination Development (2008)

B. Ellen Byrne, DDS, Ph.D.
(ADEA 2009-2012)
Chair – Research & Development (2012)
Chair – Administration (2011)

Stephen T. Radack, III, DMD
(ADA 2008-2011)
Chair – Research & Development (2010 & 2011)
Vice-Chair - JCNDE (2010)
The Joint Commission Chair and Standing Committee Chairs serve as ex-officio members of the CIE.

Robert A. Hersh, DDS  
Chair – JCNDE (2015)  
Chair – Administration (2014)

Luis J. Fujimoto, DMD  
Chair – Research & Development (2015)

Frank W. Licari, DDS, MPH, MBA  
Chair – Examination Development (2015)

Rhett L. Murray, DDS  
Chair – Administration (2015)
INBDE Validation Process and Summary of Current Validity Argument
### Twelve Steps for Test Development* (Downing, 2006)

|---|-------------|-----------------------|------------------------|---------------------|-----------------------------|---------------------|------------------------|----------------|----------------------|-----------------------------|----------------|-----------------------------|

*Bold text indicates area of current focus for the CIE.*
Examination Purpose, Clinical Relevance, and Integration

In building the INBDE, the CIE’s attention has been drawn to three central concepts:

• Examination Purpose
• Clinical Relevance
• Integration
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

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).
Integration

Integration brings to bear knowledge of biomedical, 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 biomedical 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.
Examination Purpose, Clinical Relevance, and Integration

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.
Validation Approach

- The INBDE is currently primarily supported through content related validity arguments focusing on the general appropriateness of the content domain, and the representativeness of test content relative to that content domain.
- INBDE content is currently designed to mirror the integration between foundation knowledge areas and clinical competencies, with a primary emphasis given to the clinical competencies that are necessary for successful performance as an entry-level dentist.
Content Domain

• ADEA formulated a set of clinical competencies that were regarded as being necessary for successful performance as a new dentist. The Commission on Dental Accreditation (CODA) subsequently contributed two additional competencies to this list. The competencies were scrutinized and revised for practice analysis purposes, yielding a total of 65 revised, consolidated clinical competencies.

• In 2011 the Joint Commission approved this list of 65 competencies; these competencies were regarded as defining the domain of general dentistry.

• Feedback from stakeholders and communities of interest has also been solicited and incorporated into the framework.
The Domain of Dentistry

• The Domain of Dentistry represents the clinical competencies and foundation knowledge areas required for the safe, independent, general practice of dentistry by entry-level practitioners.

• It contains 65 clinical competencies and 10 Foundation Knowledge Areas.

• The clinical competencies are grouped into three component sections:
  1) Diagnosis & Treatment Planning
  2) Oral Health Management
  3) Practice & Profession
### Diagnosis and Treatment Planning

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

- Manage patients in a hospital setting.
- Manage the unique needs relating to the oral health care of infants.
- Manage the unique needs relating to the oral health care of children.
- Manage the unique needs relating to the oral health care of adolescents.
- Manage the unique needs relating to the oral health care of adults, including the unique needs of women.
- Manage the unique needs relating to the oral health care of geriatric patients.
- Manage the unique needs relating to the oral health care of special needs patients.
- Select and administer or prescribe pharmacological agents in the treatment of dental patients.
- Anticipate, prevent, and manage complications arising from the use of therapeutic and pharmacological agents employed in patient care.
- Prevent, diagnose and manage pain and anxiety in the dental patient.
- Prevent, diagnose and manage temporomandibular disorders.
- Diagnose and manage periodontal diseases.
- Implement strategies for the clinical assessment and management of caries.
- Maintain function and promote soft and hard tissue health.
- Manage patients with oral esthetic needs.
- Diagnose and manage developmental or acquired occlusal abnormalities.
- Manage the replacement of teeth for the partially or completely edentulous patient.
- Restore partial or complete edentulism with uncomplicated fixed or removable prosthetic restorations.
- Manage the restoration of partial or complete edentulism using implant procedures.
- Diagnose and manage pulpal and periradicular diseases.
- Perform uncomplicated endodontic procedures.
- Diagnose and manage oral surgical treatment needs.
- Perform uncomplicated oral surgical procedures.
- Manage patients requiring modification of oral tissues to optimize restoration of form, function and esthetics.
- Prevent, recognize and manage medical and dental emergencies.
- Perform basic cardiac life support.
- Recognize and manage acute pain, hemorrhage, trauma, and infection of the orofacial complex.
- Recognize and manage patient abuse and/or neglect.
- Recognize and manage substance abuse.
- Evaluate outcomes of comprehensive dental care.
- Diagnose and manage oral mucosal and osseous diseases.
Practice and Profession

CC 43 Evaluate emerging trends in health care and integrate new medical knowledge and therapies relevant to oral health care.
CC 44 Evaluate social and economic trends and their impacts on oral health care.
CC 45 Utilize critical thinking and problem-solving skills.
CC 46 Evaluate scientific literature and integrate best research outcomes with patient values and other sources of information to make decisions about dental treatment.
CC 47 Apply advances in modern biology to clinical practice.
CC 48 Apply principles of ethics and jurisprudence to the practice of dentistry.
CC 49 Practice within one’s scope of competence and consult with or refer to professional colleagues when indicated.
CC 50 Apply appropriate interpersonal and communication skills.
CC 51 Apply psychosocial and behavioral principles in patient-centered care.
CC 52 Communicate effectively with individuals from diverse populations.
CC 53 Apply prevention, intervention and educational strategies to maximize oral health.
CC 54 Participate with dental team members and other health care professionals in health promotion and disease management for individuals and communities.
CC 55 Evaluate and apply contemporary clinical, laboratory and information technology resources in patient care, practice management and professional development.
CC 56 Evaluate different models of oral health care management and delivery.
CC 57 Apply principles of risk management, including informed consent and appropriate record-keeping in patient care.
CC 58 Use effective business and financial management skills.
CC 59 Use effective human resource management skills to coordinate and supervise the activity of allied dental health personnel.
CC 60 Apply quality assurance, assessment and improvement concepts.
CC 61 Assess one’s personal level of skills and knowledge relative to dental practice.
CC 62 Understand and apply local, state and federal laws and regulations pertaining to dentistry and healthcare, including OSHA and HIPPA.
CC 63 Develop a catastrophe preparedness plan for the dental practice.
CC 64 Utilize universal infection control guidelines for all clinical procedures.
CC 65 Communicate case design with laboratory technicians and evaluate the resultant restoration/prosthesis.
The successful entry-level general practitioner is focused on the prevention, diagnosis, and management of oral disease, and the promotion and maintenance of general health. This requires application of knowledge in the following areas:

<table>
<thead>
<tr>
<th>FK1</th>
<th>Molecular, biochemical, cellular, and systems-level development, structure and function</th>
</tr>
</thead>
<tbody>
<tr>
<td>FK2</td>
<td>Physics and chemistry to explain normal biology and pathobiology</td>
</tr>
<tr>
<td>FK3</td>
<td>Physics and chemistry to explain the characteristics and use of technologies and materials</td>
</tr>
<tr>
<td>FK4</td>
<td>Principles of genetic, congenital and developmental diseases and conditions and their clinical features to understand patient risk</td>
</tr>
<tr>
<td>FK5</td>
<td>Cellular and molecular bases of immune and non-immune host defense mechanisms</td>
</tr>
<tr>
<td>FK6</td>
<td>General and disease-specific pathology to assess patient risk</td>
</tr>
<tr>
<td>FK7</td>
<td>Biology of microorganisms in physiology and pathology</td>
</tr>
<tr>
<td>FK8</td>
<td>Pharmacology</td>
</tr>
<tr>
<td>FK9</td>
<td>Sociology, psychology, ethics and other behavioral sciences</td>
</tr>
<tr>
<td>FK10</td>
<td>Quantitative knowledge, critical thinking, and informatics tools</td>
</tr>
</tbody>
</table>
Content Domain Comparison

Comparison of scientific areas covered by individual *Foundation Knowledge (FK1-FK10)* and those currently covered on either Part I or Part II of NBDE

Excerpts from a presentation by Dr. Andrew Spielman to the Joint Commission’s Committee on Research and Development delivered on February 22, 2013
• The following slides represent science areas covered by Foundation Knowledge Areas 1 through 10.
• Note, that a science area potentially covered by the Foundation Knowledge does not mean it will end up with a substantial number of questions on the new exam. The size of the circle of a specific scientific field is not proportional to their relative representation on the exam.
• This is a qualitative analysis where all fields are considered equal.
Basic and Foundation Sciences covered in part by Foundation Knowledge 1 (FK1) (9C)

- FK1: Molecular, biochemical, cellular, and systems-level development, structure and function

**Color Coding**

<table>
<thead>
<tr>
<th>Part I</th>
<th>Part II</th>
<th>Parts I &amp; II</th>
<th>NEW</th>
</tr>
</thead>
</table>

- Gross Anatomy
- Head and Neck Anatomy
- Dental Anatomy
- Cancer Biology
- Cell Biology
- Biochemistry
- Embryology
- General and Systemic Pathology
- Genetics
- General Histology
- Molecular Biology
- Membrane Biology
- Molecular Pathology
- Oral Histology
- Oral Biology
- Occlusion/Gnathology
- Neuroscience
- Nutrition
- Physiology
- Pharmacology
Basic and Foundation Sciences covered in part by Foundation Knowledge 2 (FK2) (1C)

| FK2 | Physics and chemistry to explain normal biology and pathobiology |

Color Coding:
- **Part I**
- **Part II**
- **Parts I & II**
- **NEW**
Basic and Foundation Sciences covered in part by Foundation Knowledge 3 (FK3) (3C)

| FK3 | Physics and chemistry to explain the characteristics and use of technologies and materials |

- Biophysics
- Biomaterials
- Dental Material Sciences
- Basic Radiology

Color Coding

| Part I | Part II | Parts I & II | NEW |

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Basic and Foundation Sciences covered in part by Foundation Knowledge 4 (FK4) (2C)

<table>
<thead>
<tr>
<th>FK4</th>
<th>Principles of genetic, congenital and developmental diseases and conditions and their clinical features to understand patient risk</th>
</tr>
</thead>
</table>

Color Coding

- **Part I**
- **Part II**
- **Parts I & II**
- **NEW**
Basic and Foundation Sciences covered in part by Foundation Knowledge 5 (FK5) (3C)

<table>
<thead>
<tr>
<th>FK5</th>
<th>Cellular and molecular bases of immune and non-immune host defense mechanisms</th>
</tr>
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</table>

- Immunology
- Immunopathology & Biology
- Microbiology
- Virology
- Mycology
- Parasitology

Color Coding

<table>
<thead>
<tr>
<th>Part I</th>
<th>Part II</th>
<th>Parts I &amp; II</th>
<th>NEW</th>
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</thead>
</table>

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Basic and Foundation Sciences covered in part by Foundation Knowledge 6 (FK6) (5C)

| FK6 | General and disease-specific pathology to assess patient risk |

- Cellular and Molecular Pathology
- General and Systemic Pathology
- Pharmacology
- Immunopathology

Color Coding

| Part I | Part II | Parts I & II | NEW |

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Basic and Foundation Sciences covered in part by Foundation Knowledge 7 (FK7) (3C)

| FK7 | Biology of microorganisms in physiology and pathology |

- Epidemiology
- Immuno-pathology
- Microbiology
- Mycology
- Oral Biology
- Parasitology
- Pharmacology
- Preventive Medicine and Dentistry
- Pulp Biology
- Public Health
- Virology

Color Coding

- Part I
- Part II
- Parts I & II
- NEW
Basic and Foundation Sciences covered in part by Foundation Knowledge 8 (FK8) (3C)

<table>
<thead>
<tr>
<th>FK8</th>
<th>Pharmacology</th>
</tr>
</thead>
</table>

- Basic and Applied Pharmacology
- Biomedical Research
- Cancer Biology
- Evidence-based Dentistry
- Public Health Policy

Color Coding

<table>
<thead>
<tr>
<th>Part I</th>
<th>Part II</th>
<th>Parts I &amp; II</th>
<th>NEW</th>
</tr>
</thead>
</table>

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Basic and Foundation Sciences covered in part by Foundation Knowledge 9 (FK9) (4C)

| FK9 Sociology, psychology, ethics and other behavioral sciences |

- Applied Pharmacology
- Applied Nutrition
- Behavioral Sciences
- Communicat. Skills
- Cultural Competence
- Community Health
- Child & Adult Psychology
- Dental and Medical Informatics
- Ergonomics
- Ethics
- Geriatric Dentistry and Medicine
- Patients with Special Needs
- Public Health
- Sociology
- Applied Nutrition
- Behavioral Sciences
- Communicat. Skills
- Cultural Competence
- Community Health
- Child & Adult Psychology
- Dental and Medical Informatics
- Ergonomics
- Ethics
- Geriatric Dentistry and Medicine
- Patients with Special Needs
- Public Health
- Sociology

Color Coding

<table>
<thead>
<tr>
<th>Part I</th>
<th>Part II</th>
<th>Parts I &amp; II</th>
<th>NEW</th>
</tr>
</thead>
</table>

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Basic and Foundation Sciences covered in part by Foundation Knowledge 10 (FK10) (5C)

| FK10 | Quantitative knowledge, critical thinking, and informatics tools |

- Applied Research
- Community Dentistry
- Critical evaluation of the scientific literature
- Dental, Medical and Health Informatics
- Dental Public Health
- Descriptive & Analytical Epidemiology
- Evidence-based Dentistry
- Health Promotion
- Library sciences
- Preventive Dentistry
- Statistics

Color Coding:
- Part I
- Part II
- Parts I & II
- NEW
The Domain of Dentistry

- The Domain of Dentistry is structured as a matrix of clinical competencies (rows) and Foundation Knowledge Areas (columns). Each cell of the matrix represents the contribution of a given Foundation Knowledge area to the performance of a particular clinical competency.

- A practice analysis was conducted in 2011 with a sample of new dentists (i.e., dentists who had obtained their license within the previous five years) to empirically determine the importance of these 65 clinical competencies for entry level dentists.

- This practice analysis collected ratings concerning the frequency with which each clinical competency was utilized in entry level practice, as well as the criticality of each competency to patient care.
Content Domain

- All 65 clinical competencies had criticality ratings that were rated as being at least “moderately important to patient care,” thus affirming the appropriateness of each of these competencies as the content basis for the INBDE.
- Practice analysis frequency and criticality ratings were used to calculate importance ratings that signified the overall importance of each clinical competency.
- Practice analysis importance ratings were transformed into weighted importance ratings. These weighted importance ratings sum to 100%, with each rating indicating the importance of that competency as a percentage relative to the other competencies.
Knowledge Areas Required For Successful Performance Within The Content Domain

• Ten foundation knowledge areas were regarded as prerequisites to successful performance on the clinical competencies.

• Two science review panels were conducted to confirm the relevance of these foundation knowledge areas to the clinical competencies.

• Panelists made ratings indicating the strength of the perceived relationship between each foundation knowledge area and each clinical competency.

• All ten foundation knowledge areas were perceived as being related to performance on one or more of the 65 clinical competencies, thus affirming the appropriateness of this set of foundation knowledge areas for the INBDE.
Knowledge Areas Required For Successful Performance Within The Content Domain

- The weighted importance of each clinical competency (i.e., as identified by the practice analysis) is used to determine the total number of items available for allocation to that clinical competency.

- The relative strength of the perceived relationship between each foundation knowledge area and each competency (i.e., from the science panels) provides the mechanism for dividing up those available items among the foundation knowledge areas.
### Illustration of the Rating Exercise

#### Figure 1 Example of a Section of the Matrix Document

<table>
<thead>
<tr>
<th>Component Sections</th>
<th>BSFK 1</th>
<th>BSFK 2</th>
<th>BSFK 3</th>
<th>BSFK 4</th>
<th>BSFK 5</th>
<th>BSFK 6</th>
<th>BSFK 7</th>
<th>BSFK 8</th>
<th>BSFK 9</th>
<th>BSFK 10</th>
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</thead>
<tbody>
<tr>
<td>Diagnosis &amp; Treatment Planning</td>
<td>C 1</td>
<td>C 2</td>
<td>C 3</td>
<td>C 4</td>
<td></td>
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<tr>
<td>Oral Health Management</td>
<td>C 5</td>
<td>C 6</td>
<td>C 7</td>
<td>C 8</td>
<td></td>
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<tr>
<td>Practice Profession</td>
<td>C 9</td>
<td>C 10</td>
<td>C 11</td>
<td>C (etc)</td>
<td></td>
<td></td>
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</table>

BSFK = Basic Science Foundation Knowledge

C = Clinical Competencies

The Component Sections organize the clinical competencies in major groupings.
Hypothetical Test Specifications

<table>
<thead>
<tr>
<th></th>
<th>FK1</th>
<th>FK2</th>
<th>FK3</th>
<th>FK4</th>
<th>FK5</th>
<th>FK6</th>
<th>FK7</th>
<th>FK8</th>
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<th>FK10</th>
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<tr>
<td>%</td>
<td>13.3</td>
<td>3.3</td>
<td>10.7</td>
<td>7.7</td>
<td>6.3</td>
<td>11.3</td>
<td>9.3</td>
<td>10.3</td>
<td>16.7</td>
<td>11.0</td>
<td>99.9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>FK1</th>
<th>FK2</th>
<th>FK3</th>
<th>FK4</th>
<th>FK5</th>
<th>FK6</th>
<th>FK7</th>
<th>FK8</th>
<th>FK9</th>
<th>FK10</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>450 items</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTP</td>
<td>15</td>
<td>9</td>
<td>10</td>
<td>15</td>
<td>10</td>
<td>17</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>9</td>
<td>121</td>
<td>26.9%</td>
</tr>
<tr>
<td>OHM</td>
<td>29</td>
<td>10</td>
<td>20</td>
<td>13</td>
<td>11</td>
<td>20</td>
<td>18</td>
<td>21</td>
<td>23</td>
<td>11</td>
<td>176</td>
<td>39.1%</td>
</tr>
<tr>
<td>PP</td>
<td>8</td>
<td>4</td>
<td>14</td>
<td>11</td>
<td>7</td>
<td>13</td>
<td>11</td>
<td>12</td>
<td>40</td>
<td>33</td>
<td>153</td>
<td>34.0%</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>23</td>
<td>44</td>
<td>39</td>
<td>28</td>
<td>50</td>
<td>40</td>
<td>45</td>
<td>76</td>
<td>53</td>
<td>450</td>
<td>100%</td>
</tr>
<tr>
<td>%</td>
<td>11.5</td>
<td>5.1</td>
<td>9.8</td>
<td>8.7</td>
<td>6.2</td>
<td>11.1</td>
<td>8.9</td>
<td>10.0</td>
<td>16.9</td>
<td>11.8</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

PS. DTP = Diagnosis & Treatment Planning. OHM = Oral Health Management. PP = Practice & Profession.
At its April 2013 meeting, the Joint Commission reviewed the methodology and resulting test specifications. The following four key 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).
Item Development Approach

- In 2014, the Joint Commission approved model items and operational recommendations in the following areas:
  - 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 2015, the Joint Commission is continuing to refine INBDE model items and its approach in the above areas. Most notably, the Joint Commission has greatly refined the development of a “Patient Box” to present patient information within items.
Guiding Principles in INBDE item development

• Examination purpose drives all development decisions.
• Focus on clinical relevance.
• Promote the clinical relevance of the basic sciences by placing foundation knowledge areas within the context of clinical competencies.
• Increased focus on the general dentist in item writing.
• Standardized presentation format and conventions for presenting information.
• Direct and concise wording that focuses examinees on the concept tested as opposed to language/item wording.
• Increased accuracy, validity, and fairness/sensitivity through a thorough, multi-faceted item development and review process that capitalizes on the unique expertise of the individuals involved.
### Patient History Chart

**SAMPLE TESTLET**

<table>
<thead>
<tr>
<th>Age</th>
<th>65 YRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>☑ Male □ Female</td>
</tr>
<tr>
<td>Height</td>
<td>5' 09&quot;</td>
</tr>
<tr>
<td>Weight</td>
<td>240 LBS</td>
</tr>
<tr>
<td>B/P</td>
<td>170/100</td>
</tr>
<tr>
<td>Chief Complaint</td>
<td>“I lost the filling in my back tooth.”</td>
</tr>
<tr>
<td>Medical History</td>
<td>last saw his physician 2 years ago father died of heart attack at age 52</td>
</tr>
<tr>
<td>Current Medications</td>
<td>diuretic for hypertension statin for hypercholesteremia low dose aspirin</td>
</tr>
<tr>
<td>Social History</td>
<td>married, grown children retired construction foreman has smoked a pipe daily for 25 years</td>
</tr>
</tbody>
</table>

**SCENARIO**

The patient presents for replacement of a filling in tooth 19. He reports that he lost the filling over a year ago, but he delayed seeking care because the tooth has not been sensitive. Upon examination, tooth 19 has a missing occlusal restoration and a fractured ML cusp.

Extraoral examination revealed mild actinic damage of his lower lip vermillion border.
INBDE Patient Box

A corner tab signifies that a Patient Box is shared by multiple items.

Reminder:
The actual display of the Patient Box during the examination will depend upon the capability of the selected examination administration vendor.

<table>
<thead>
<tr>
<th>Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female, 28 years old.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chief Complaint</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I haven’t been able to open my mouth for two days.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Background and/or Patient History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three days prior, left mandibular third molar extraction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum opening is 10 mm</td>
</tr>
</tbody>
</table>
**INBDE Patient Box: Patient Section**

<table>
<thead>
<tr>
<th>Section</th>
<th>Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient</strong></td>
<td>Female, 28 years old.</td>
</tr>
<tr>
<td><strong>Chief Complaint</strong></td>
<td>“I haven’t been able to open my mouth for two days.”</td>
</tr>
<tr>
<td><strong>Background and/or Patient History</strong></td>
<td>Three days prior, left mandibular third molar extraction.</td>
</tr>
<tr>
<td><strong>Current Findings</strong></td>
<td>Maximum opening is 10 mm</td>
</tr>
</tbody>
</table>

**Description**
- This section presents patient demographic characteristics (gender, age, and potentially ethnicity).

**Presentation Format**
- Male or Female, x years old.
- Ethnicity may be included if relevant.

**Example**
- Female, 28 years old.
**Patient**

Female, 28 years old.

**Chief Complaint**

“I haven’t been able to open my mouth for two days.”

**Background and/or Patient History**

Three days prior, left mandibular third molar extraction.

**Current Findings**

Maximum opening is 10 mm

### INBDE Patient Box: Chief Complaint Section

<table>
<thead>
<tr>
<th>Section</th>
<th>Chief Complaint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>• This section presents the chief complaint as described by the patient or a guardian.</td>
</tr>
<tr>
<td>Presentation Format</td>
<td>• If quoted directly from the patient, enclose the statement in quotation marks and voice the statement in the first person.</td>
</tr>
<tr>
<td>Example</td>
<td>• “I’ve been unable to open my mouth for two days.”</td>
</tr>
</tbody>
</table>
Patient

Female, 28 years old.

Chief Complaint

“I haven’t been able to open my mouth for two days.”

Background and/or Patient History

Three days prior, left mandibular third molar extraction.

Current Findings

Maximum opening is 10 mm

Section | Background/Patient History
---|---
Description | • This section presents background information such as history of dental diagnosis and treatment, medical conditions, allergies, social history, etc.
Presentation Format | • The information is assumed to be factual and provided by the treating dentist.
Example | • Three days prior, left mandibular third molar extraction.
**Patient**
- Female, 28 years old.

**Chief Complaint**
- “I haven’t been able to open my mouth for two days.”

**Background and/or Patient History**
- Three days prior, left mandibular third molar extraction.

**Current Findings**
- Maximum opening is 10 mm

---

**INBDE Patient Box: Current Findings Section**

<table>
<thead>
<tr>
<th>Section</th>
<th>Current Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>This section presents information collected by dental professionals during the current visit.</td>
</tr>
<tr>
<td><strong>Presentation Format</strong></td>
<td>Can include information such as height and weight, vital signs, results of diagnostic tests, and a general assessment of the patient condition.</td>
</tr>
</tbody>
</table>
| **Example**      | - Facial edema  
                  - Lymphadenopathy  
                  - Extensive apical radiolucency associated with tooth 6  
                  - Temp. 100.3°  
                  - Blood glucose 240 mg/dL  
                  - BP 150/93 |
INBDE Model Items

… but first, a quick reminder.

The INBDE is currently under development. As such, the specific details associated with this examination program are evolving and will change over time. Information shared in this presentation should be regarded as tentative and based on preliminary program requirements and the best available information as of the date of this presentation.

The model items presented WILL change over time.
Which graph best shows the patient’s likely plaque pH response after drinking a sugary beverage?

Patient
Female, 75 years old

Chief Complaint
“My mouth has been dry for over a month.”

Background and/or Patient History
Oropharyngeal cancer treated by radiation.

Current Findings

A
B
C
D

Control
Which graph best shows the patient’s likely plaque pH response after drinking a sugary beverage?

A

B

C

D

Control

Answer: A
Where would a loss of taste be expected?

A. 1 and 2
B. 2 and 3
C. 3 and 4
D. 2, 3, and 4

Patient
Male, 38 years old

Chief Complaint
“I haven’t been able to taste on the left side of my tongue for the past three days.”

Background and/or Patient History
Left inferior alveolar nerve block during a prior dental treatment.
### Patient
- Male, 38 years old

### Chief Complaint
"I haven’t been able to taste on the left side of my tongue for the past three days.”

### Background and/or Patient History
Left inferior alveolar nerve block during a prior dental treatment.

### Current Findings

**Where would a loss of taste be expected?**

- **A. 1 and 2**
- **B. 2 and 3**
- **C. 3 and 4**
- **D. 2, 3, and 4**
The patient is scheduled for an MOD amalgam. What is the correct protocol?

A. Obtain an INR the morning of the procedure.
B. Proceed without treatment modification.
C. Discontinue Pradaxa® the morning of the appointment.
D. Use lidocaine 2% with 1:50,000 epinephrine.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Male, 75 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Complaint</td>
<td>“I’m here to have my filling done.”</td>
</tr>
<tr>
<td>Background and/or Patient History</td>
<td>Atrial fibrillation</td>
</tr>
<tr>
<td>Medications:</td>
<td>dabigatran (Pradaxa®) metoprolol (Toprol®)</td>
</tr>
<tr>
<td>Current Findings</td>
<td></td>
</tr>
</tbody>
</table>
The patient is scheduled for an MOD amalgam. What is the correct protocol?

A. Obtain an INR the morning of the procedure.
B. **Proceed without treatment modification.**
C. Discontinue Pradaxa® the morning of the appointment.
D. Use lidocaine 2% with 1:50,000 epinephrine.
### INBDE Model Items

**Model Item 33**

<table>
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<tr>
<th><strong>Patient</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male, 75 years old</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Chief Complaint</strong></th>
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</thead>
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<table>
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<tr>
<th><strong>Background and/or Patient History</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial fibrillation</td>
</tr>
<tr>
<td>Medications:</td>
</tr>
<tr>
<td>dabigatran (Pradaxa®)</td>
</tr>
<tr>
<td>metoprolol (Toprol®)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Current Findings</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The procedure results in a carious exposure of the pulp. The patient chooses to have the tooth extracted. What is the next step at this appointment?</td>
</tr>
</tbody>
</table>

A. Prophylactic antibiotics and extraction  
B. Pulp cap and temporary restoration  
C. Discontinue Pradaxa® for three days followed by extraction  
D. Immediate extraction and placement of sutures if necessary
The procedure results in a carious exposure of the pulp. The patient chooses to have the tooth extracted. What is the next step at this appointment?

A. Prophylactic antibiotics and extraction
B. Pulp cap and temporary restoration
C. Discontinue Pradaxa® for three days followed by extraction
D. Immediate extraction and placement of sutures if necessary

<table>
<thead>
<tr>
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<table>
<thead>
<tr>
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<tr>
<td>“I’m here to have my filling done.”</td>
<td></td>
</tr>
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</table>

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<tr>
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<th></th>
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</thead>
<tbody>
<tr>
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<td></td>
</tr>
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<td>Medications:</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>metoprolol (Toprol®)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Findings</th>
<th></th>
</tr>
</thead>
</table>
Item Writing Progress

- The first INBDE pilot Test Construction Committees have been formed and have met twice.
  - Diagnosis and Treatment Planning (5)
  - Oral Health Management (5)
  - Practice and Profession (5)
- Across the two TCC sessions, the 15 INBDE TCC members drafted a total of 193 items.
- In addition to writing items, these initial TCC were intended to help troubleshoot the item development process (i.e., prior to expanding membership and ramping up production).
  - Some things are working well (e.g., TCCs meeting concurrently)
  - Some challenges have been identified (e.g., “writing to a box.”)
- The CIE has been discussing the issues to help address the identified challenges. Project plans have been updated accordingly.
Field Test A: Obtain feedback from examinees concerning the integration of the biomedical sciences.

Field Tests B and C:
INBDE content will be Field Tested prior to implementation. Development and implementation of Field Testing will be designed to serve multiple purposes, which are as follows:

a) Confirm that the new item development guidelines and procedures are working effectively.
b) Confirm the quality and performance of INBDE items.
c) Provide input to inform any necessary modifications to procedures and/or item types.
d) Enable the Joint Commission to understand the correspondence between NBDE Part II outcomes and INBDE outcomes. (Primarily Field Test C, but somewhat for Field Test B.)

NOTE: Due to the fact that Field Testing is not high stakes, it is anticipated that results will differ compared to what would be achieved during actual implementation (e.g., items may perform differently, and the correspondence in outcomes may differ as well).

- INBDE Preliminary Operational Recommendations 2014
## INBDE Project Phases

<table>
<thead>
<tr>
<th>Stakeholders and Communities of Interest</th>
<th>(I) Design and Build</th>
<th>(II) Transition Period</th>
<th>(III) Full Implementation</th>
<th>(IV) Monitoring and Refinement</th>
</tr>
</thead>
<tbody>
<tr>
<td>State boards</td>
<td>Understand, Prepare, Participate</td>
<td>Acclimate</td>
<td>Business as Usual (only better)</td>
<td></td>
</tr>
<tr>
<td>Educators</td>
<td>Understand, Participate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td></td>
<td>Wait and See</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental professionals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Public</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint Commission</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- CIE (ad hoc)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- JCNDE Staff</td>
<td>Support NBDE and INBDE</td>
<td>Support INBDE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*As work progresses, at the discretion of the JCNDE Chair specific INBDE activities will transition to Joint Commission standing committees.
INBDE Implementation Timeframe

- The Joint Commission will provide stakeholders and communities of interest with at least four years’ notice prior to the full implementation of the INBDE.
- The Joint Commission and the CIE recognize that the development of the INBDE takes place within a much larger context.
- State boards are viewed as key stakeholders, and educators, students, dental professionals, and the public are viewed as critical communities of interest.
- Communication, participation, and feedback are critical to the success of the effort.
- Please visit the INBDE web site. Make sure to direct any questions and feedback to jcndecie@ada.org.
Summary

• The impetus for the INBDE was environmental change and the need to find a better way of serving stakeholders and communities of interest.

• The INBDE emerged through a carefully planned process that reflected the needs of those groups and the validity of the examination.

• Examination purpose is guiding all decisions pertaining to examination development.

• The Joint Commission and the CIE have articulated principles to guide item development, and model items to illustrate the types of INBDE items the Joint Commission would like TCCs to create.

• The item development process is now underway
Additional Information and Resources

Joint Commission on National Dental Examinations
http://www.ada.org/en/jcnde

Integrated National Board Dental Examination
http://www.ada.org/en/jcnde/inbde/

National Boards (Examination Guides, FAQ’s, DENTPIN® Information, Score Report Requests)
  Part I and Part II:
    http://www.ada.org/en/jcnde/examinations/nbde-general-information
  Dental Hygiene:

Test Construction Committee Information
  http://www.ada.org/en/jcnde/examinations/test-construction/

Technical Reports, ADEA Presentations, Item Development Guides
  http://www.ada.org/en/jcnde/news-resources/technical-reports
  http://www.ada.org/en/jcnde/news-resources/presentations
Contact Information

Joint Commission on National Dental Examinations
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nbexams@ada.org

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Sara S. Hennings, Ph.D.
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Nicholas B. Hussong, B.A.
Manager, Test Administration
hussongn@ada.org

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