

NATIONAL BOARD DENTAL EXAMINATION SPECIFICATIONS

2006

A publication of the Joint Commission on National Dental Examinations
American Dental Association, 211 East Chicago Avenue, Chicago, Illinois 60611

National Board Dental Examinations are comprised exclusively of multiple-choice test items. National Board Dental Examinations are administered in two batteries, called *Part I* and *Part II*.

The Basic Structure of Part I

Each *Part I Examination* consists of 100 test items. Part I Examinations will include test items that have clinical applications. The four examinations on the basic biomedical sciences are titled:

1. Anatomic Sciences
2. Biochemistry-Physiology
3. Microbiology-Pathology
4. Dental Anatomy and Occlusion

The Basic Structure of Part II

The comprehensive *Part II Examination* consists of 500 test items. The discipline-based component (Component A) includes 400 items and the case-based component (Component B) includes 100 items based on 8-10 case problems. Part II examinations will include test items (approximately 30 percent) that have references pertinent to the basic sciences.

Discipline-Based Component (400 items)

The test items that comprise the discipline-based component are derived from the following disciplines:

1. Endodontics
2. Operative Dentistry
3. Oral and Maxillofacial Surgery / Pain Control
4. Oral Diagnosis
5. Orthodontics / Pediatric Dentistry
6. Patient Management
7. Periodontics
8. Pharmacology
9. Prosthodontics

Case-Based Component (100 items)

The case-based component of the Part II Examination presents events dealing with actual patients. The patient cases are developed to include the following approximate distribution: Adults--70 percent, Children--30 percent. A minimum of 15 percent of Component B test questions will address the medical management of compromised adults and children. A *compromised patient* is defined as a person whose health status requires modification of standard treatment.

Each case presentation in the examination contains two sections: the first section appears in a *Booklet of Cases* and consists of:

1. a synopsis of a patient's health and social histories,
2. the patient's dental charting,
3. radiographs, and
4. clinical photographs of the patient (when necessary).

The second section appears in a *Test Booklet* and contains from 10 to 15 questions about various aspects of this patient's dental care. These questions, totaling 100 for all of the cases, might derive from any of the basic sciences and clinical disciplines, including Patient Management. The proportion stemming from any particular discipline depends upon the nature of the case itself. For example, the case of an elderly adult might be based upon Maxillofacial Surgery / Pain Control, Prosthodontics, and Operative Dentistry; whereas, a child's case might derive from Orthodontics, Pediatric Dentistry, and Patient Management.

In responding to these questions, the test taker must:

1. interpret the findings and information provided.
2. identify the problems and make diagnoses.
3. select materials, technique, and armamentarium.
4. apply treatment.
5. evaluate progress and complications.
6. establish procedures for prevention and maintenance.

PART I

- 2 -

ANATOMIC SCIENCES [100]

- 1.0. Gross Anatomy* [50]
 - 1.1. Head
 - 1.1.1. Oral cavity
 - 1.1.2. Extraoral structures
 - 1.1.3. Osteology
 - 1.1.4. TMJ and muscles of mastication
 - 1.2. Neck
 - 1.3. Axilla, shoulders, and upper extremities
 - 1.4. Thoracic cavity
 - 1.5. Abdominopelvic cavity
 - 1.6. Central nervous system & neuroanatomy
- 2.0. Histology [23]
 - 2.1. Ultrastructure
 - 2.2. Basic tissues
 - 2.3. Bone, cartilage, and joints
 - 2.4. Lymphatic and circulatory systems
 - 2.5. Endocrine system
 - 2.6. Respiratory system
 - 2.7. Gastrointestinal system
 - 2.8. Genitourinary system
 - 2.9. Integument
- 3.0. Oral Histology [16]
 - 3.1. Tooth and supporting tissues
 - 3.2. Soft oral tissues
 - 3.3. Temporomandibular joint
- 4.0. Developmental Biology [11]
 - 4.1. Osteogenesis
 - 4.2. Tooth development, eruption, and movement
 - 4.3. Facial and branchial arch development
 - 4.4. General embryology

* The following topics will be considered under each category of gross anatomy.

Bone
Muscles
Fascia
Nerves (peripheral and autonomic)
Arteries, veins, and lymphatics
Spaces and cavities
Joints and ligaments
Endocrines and exocrines

BIOCHEMISTRY-PHYSIOLOGY [100]

- 1.0. Biological Compounds [10]
 - 1.1. Sugars and carbohydrates
 - 1.2. Amino acids and proteins
 - 1.3. Lipids
 - 1.4. Nucleic acids and metabolism
 - 1.5. Nutrients and minerals
 - 1.6. Intradisciplinary and clinical/cross correlation
- 2.0. Metabolism [17]
 - 2.1. Bioenergetics
 - 2.2. Enzymology
 - 2.3. Catabolism
 - 2.4. Anabolism
 - 2.5. Urea cycle
 - 2.6. Regulation
 - 2.7. Intradisciplinary and clinical/cross correlation
- 3.0. Molecular and Cellular Biology [10]
 - 3.1. DNA/RNA and protein synthesis
 - 3.2. Genetic engineering
 - 3.3. Cell cycle
 - 3.4. Intradisciplinary and clinical/cross correlation
- 4.0. Connective Tissues [8]
 - 4.1. Soft tissue
 - 4.2. Hard tissue/calcification
 - 4.3. Intradisciplinary and clinical/cross correlation
- 5.0. Membranes [4]
 - 5.1. Structure
 - 5.2. Function
 - 5.3. Intradisciplinary and clinical/cross correlation
- 6.0. Nervous System [6]
 - 6.1. General properties
 - 6.2. Central nervous system
 - 6.3. Autonomic nervous system
 - 6.4. Somatic nervous system
 - 6.5. Intradisciplinary and clinical/cross correlation
- 7.0. Muscle [6]
 - 7.1. Skeletal
 - 7.2. Smooth
 - 7.3. Cardiac
 - 7.4. Intradisciplinary and clinical/cross correlation
- 8.0. Circulation [9]
 - 8.1. Fluid content and dynamics
 - 8.2. Coagulation
 - 8.3. Cardiodynamics and electrophysiology
 - 8.4. Regulatory mechanisms
 - 8.5. Intradisciplinary and clinical/cross correlation

BIOCHEMISTRY-PHYSIOLOGY

- 9.0. Respiration [6]
 - 9.1. Mechanical aspects
 - 9.2. Gas exchange and transport
 - 9.3. Regulation
 - 9.4. Intradisciplinary and clinical/cross correlation
- 10.0. Renal [8]
 - 10.1. Functional anatomy
 - 10.2. Blood flow and filtration
 - 10.3. Reabsorption and secretion
 - 10.4. Regulation
 - 10.5. Acid-base balance
 - 10.6. Intradisciplinary and clinical/cross correlation
- 11.0 Oral Physiology [3]
 - 11.1. Taste
 - 11.2. Mastication (with reflexes)
 - 11.3. Swallowing
- 12.0 Digestion [5]
 - 12.1. Neuromuscular
 - 12.2. Secretions
 - 12.3. Absorption
 - 12.4. Regulation
 - 12.5. Intradisciplinary and clinical/cross correlation
- 13.0 Endocrines [8]
 - 13.1. Pituitary/hypothalamus
 - 13.2. Reproduction
 - 13.3. Signaling systems
 - 13.4. Pancreas/parathyroid
 - 13.5. Adrenal/thyroid
 - 13.6. Intradisciplinary and clinical/cross correlation

MICROBIOLOGY-PATHOLOGY [100]

- 1.0. General Microbiology [21]
 - 1.1. Microbial biochemistry and physiology
 - 1.2. Microbial cytology
 - 1.3. Microbial variations and genetics
 - 1.4. Sterilization and disinfection
 - 1.5. Biology of microorganisms
 - 1.5.1. Bacteria
 - 1.5.2. Viruses
 - 1.5.3. Fungi
 - 1.6. Antibiotics and chemotherapy
 - 1.7. Oral ecology and epidemiology
- 2.0. Reactions of Tissue to Injury [10]
 - 2.1. Inflammation and repair
 - 2.2. Physical and chemical injury
 - 2.3. Hemodynamic disorders

MICROBIOLOGY-PATHOLOGY

- 3.0. Immunology and Immunopathology (at least 3 on oral immunology) [13]
 - 3.1. Host defense mechanisms
 - 3.2. Hypersensitivity
 - 3.3. Immune system
- 4.0. Microbiology, Immunology, and Pathology of Specific Infectious Diseases (at least 8 on oral diseases) [22]
 - 4.1. Bacterial
 - 4.2. Viral
 - 4.3. Fungal
 - 4.4. Chlamydial and rickettsial
- 5.0. Systemic Pathology [22]
 - 5.1. Cardiovascular
 - 5.2. Respiratory
 - 5.3. Gastrointestinal and hepatobiliary
 - 5.4. Genitourinary
 - 5.5. Blood-lymphatic
 - 5.6. Endocrine
 - 5.7. Musculoskeletal
 - 5.8. Genetic diseases
 - 5.9. Nervous system
- 6.0. Growth Disturbances [12]
 - 6.1. Non-neoplastic
 - 6.2. Neoplasms--etiology, epidemiology, & biology
 - 6.3. Specific neoplasms

DENTAL ANATOMY AND OCCLUSION [100]

- 1.0. Tooth Morphology [44]
 - 1.1. Primary
 - 1.2. Permanent
 - 1.2.1. Incisors
 - 1.2.2. Canines
 - 1.2.3. Premolars
 - 1.2.4. Molars
- 2.0. Pulp Cavity Morphology [5]
- 3.0. Calcification and Eruption [6]
- 4.0. Principles of Occlusion and Function [37]
 - 4.1. Functional anatomy
 - 4.1.1. Interarch (static and movement)
 - 4.1.1.1. Anterior teeth
 - 4.1.1.2. Posterior teeth
 - 4.1.2. Intra-arch
 - 4.2. Masticatory physiology and biomechanics
 - 4.2.1. Temporomandibular joint
 - 4.2.2. Muscles and ligaments
 - 4.2.3. Determinants of occlusion
- 5.0. Clinical Considerations—Tooth Morphology

and Anomalies [8]

PART II (COMPONENT A)

ENDODONTICS [30]

- 1.0. Clinical Diagnosis, Case Selection, Treatment Planning, and Patient Management [14]
 - 1.1. Pulpal
 - 1.2. Periradicular
 - 1.3. Periodontal
 - 1.4. Differential diagnosis of orofacial pain
 - 1.5. Therapeutics
 - 1.6. Clinical examination
 - 1.7. Testing procedures
 - 1.8. Radiographic interpretation
 - 1.9. Medical emergencies
- 2.0. Basic Endodontic Treatment Procedures [8]
 - 2.1. Non-surgical
 - 2.2. Surgical
 - 2.3. Emergency
 - 2.4. Sterilization and asepsis
 - 2.5. Radiographic techniques
 - 2.6. Endodontic instruments and material
 - 2.7. Resorptions
- 3.0. Procedural Complications [3]
 - 3.1. Ledging
 - 3.2. Perforations
 - 3.3. Separated instruments
 - 3.4. Root fractures
- 4.0. Traumatic Injuries [2]
 - 4.1. Crown fractures
 - 4.2. Root fractures
 - 4.3. Displacements
 - 4.4. Avulsions
- 5.0. Adjunctive Endodontic Therapy [1]
 - 5.1. Vital pulp therapy
 - 5.2. Treatment of developing teeth
 - 5.3. Bleaching
 - 5.4. Restoration
 - 5.5. Endodontic instruments and materials
- 6.0. Post-Treatment Evaluation [2]
 - 6.1. Outcomes
 - 6.2. Management of endodontic failures

OPERATIVE DENTISTRY [45]

- 1.0. Dental Caries [8]
 - 1.1. Etiology
 - 1.2. Pathogenesis
 - 1.3. Prevention
 - 1.4. Remineralization
- 2.0. Examination, Diagnosis, and Treatment Planning [25]
 - 2.1. Examination and diagnosis
 - 2.1.1. Caries
 - 2.1.2. Abrasion, cracked tooth, others
 - 2.2. Treatment sequencing, placement, and replacement
 - 2.3. Selection of restorative materials
 - 2.4. Restorative failure
 - 2.5. Postoperative problems
- 3.0. General Operative Procedures [3]
 - 3.1. Instruments and equipment
 - 3.2. Control of the operating field
 - 3.3. Soft tissue management
 - 3.4. Esthetic considerations--bleaching, color
- 4.0. Preparation of Cavities [3]
 - 4.1. Basic principles, instrumentation, and nomenclature
 - 4.2. Preparation
 - 4.2.1. Dental amalgams
 - 4.2.2. Cast gold
 - 4.2.3. Tooth colored restorative materials
- 5.0. Restoration of Prepared Cavities [6]
 - 5.1. Biomaterials science – principles, properties, composition, color science
 - 5.2. Manipulation and finishing of restorative materials
 - 5.2.1. Dental amalgam
 - 5.2.2. Indirect restoration
 - 5.2.3. Direct esthetic materials
 - 5.2.4. Cements, bases and liners, and interim restorations
 - 5.2.5. Occlusion

ORAL AND MAXILLOFACIAL SURGERY / PAIN CONTROL [43]

- 1.0. Surgery [18]
 - 1.1. Dentoalveolar
 - 1.2. Reconstructive (including preprosthetic implants, transplants, bone grafting)
 - 1.3. Trauma
 - 1.4. Orthognathic
 - 1.5. Facial Pain -- temporomandibular joint
 - 1.6. Lesions
 - 1.7. Infections
- 2.0. Anxiety and Pain Control [6]
 - 2.1. Local anesthesia
 - 2.1.1. Anatomy and technique
 - 2.1.2. Clinical pharmacology
 - 2.1.3. Complications
 - 2.2. Conscious sedation
 - 2.2.1. Oral
 - 2.2.2. Inhalation
 - 2.2.3. Intravenous
 - 2.2.4. Complications
- 3.0. Medical Assessment and Emergency Care [15]
- 4.0. Treatment Plan [2]
- 5.0. Diagnosis [2]

ORAL DIAGNOSIS [44]

- 1.0. Oral Pathology [37]
 - 1.1. Developmental defects of the oral and maxillofacial region
 - 1.1.1. Defects
 - 1.1.2. Developmental cysts
 - 1.1.3. Other rare developmental anomalies
 - 1.2. Abnormalities of the teeth
 - 1.2.1. Environmental alterations of teeth
 - 1.2.2. Developmental alterations of teeth
 - 1.3. Pulpal and periapical disease
 - 1.4. Bacterial infections
 - 1.5. Fungal and protozoal diseases
 - 1.6. Viral infections
 - 1.7. Physical and chemical injuries
 - 1.8. Allergies and immunologic diseases
 - 1.9. Epithelial pathology
 - 1.10. Salivary gland pathology
 - 1.11. Soft tissue growths
 - 1.12. Hematologic disorders
 - 1.13. Bone pathology
 - 1.14. Odontogenic cysts and tumors
 - 1.14.1. Cysts
 - 1.14.2. Tumors
 - 1.15. Dermatologic Diseases
 - 1.16. Oral Manifestations of Systemic Disease
 - 1.17. Facial Pain and Neuromuscular Diseases
- 2.0. Oral Radiology [7]
 - 2.1. Physical principles of x-radiation (radiation physics)
 - 2.2. Radiobiological concepts (radiobiology)

ORTHODONTICS / PEDIATRIC DENTISTRY [58]

- 2.3. Radiographic technique
- 2.4. Normal radiographic anatomy
- 1.0. Individual Tooth Pathology [15]
 - 1.1. Basic background and epidemiology
 - 1.1.1. Tooth development
 - 1.1.2. Etiology
 - 1.1.3. Prevention
 - 1.2. Database, diagnosis, and treatment planning
 - 1.2.1. Clinical Findings
 - 1.2.2. Radiographic
 - 1.2.3. Laboratory studies
 - 1.3. Clinical procedures
 - 1.3.1. Restorative
 - 1.3.2. Surgery
 - 1.3.3. Local anesthesia
 - 1.3.4. Sealants
- 2.0. Supporting Tissue Pathology [9]
 - 2.1. Basic background and epidemiology
 - 2.1.1. Etiology
 - 2.1.2. Incidence
 - 2.2. Database, diagnosis, and treatment planning
 - 2.2.1. Clinical findings
 - 2.2.2. Radiographic
 - 2.2.3. Laboratory
 - 2.3. Clinical Procedures
 - 2.3.1. Medication
 - 2.3.2. Hygiene
- 3.0. Dentofacial Variations [7]
 - 3.1. Basic background and epidemiology
 - 3.1.1. Growth patterns
 - 3.1.2. Occlusal development
 - 3.1.3. TMJ dysfunction
 - 3.1.4. Etiology
 - 3.2. Database, diagnosis, and treatment planning
 - 3.2.1. Casts
 - 3.2.2. Clinical findings
 - 3.2.3. Cephalometric
 - 3.2.4. Facial appearance
 - 3.3. Clinical procedures
 - 3.3.1. Diagnosis and space management
 - 3.3.2. Removable appliances
 - 3.3.3. Fixed appliances
 - 3.3.4. Tooth movement principles
 - 3.3.5. Surgery
 - 3.3.6. TMJ dysfunction
- 4.0. Behavior [12]
 - 4.1. Basic background and epidemiology
 - 4.1.1. Developmental psychology
 - 4.1.2. Cultural variation
 - 4.2. Database, diagnosis, and treatment planning
 - 4.2.1. History and interview
 - 4.3. Clinical management procedures
 - 4.4. Pharmacologic anxiety management
- 5.0. Systemic Pathology [15]
 - 5.1. Basic background and epidemiology
 - 5.1.1. Congenital
 - 5.1.2. Endocrine
 - 5.1.3. Nutrition

ORTHODONTICS / PEDIATRIC DENTISTRY

- 5.2. Database, diagnosis, and treatment planning
 - 5.2.1. History and review
 - 5.2.2. Handicapped
- 5.3. Clinical procedures
 - 5.3.1. Treatment modifications
 - 5.3.2. Special care
 - 5.3.3. Emergencies

PATIENT MANAGEMENT [56]

- 1.0. Communication and Interpersonal Skills [11]
 - 1.1. Nonverbal communication
 - 1.2. Verbal communication
 - 1.2.1. Listening skills
 - 1.2.2. Responding skills
 - 1.3. Interviewing skills
 - 1.4. Management and problem behavior
 - 1.5. General principles of dentist/patient relationship
 - 1.6. Case presentation or treatment planning
 - 1.6.1. Giving information
 - 1.6.2. Minimizing resistance
 - 1.6.3. Patient education
- 2.0. Anxiety and Pain Control [6]
 - 2.1. Anxiety
 - 2.1.1. Etiology
 - 2.1.2. Recognition
 - 2.1.3. Management
 - 2.2. Pain
 - 2.2.1. Psychophysiology
 - 2.2.2. Management
 - 2.3. Stress
- 3.0. Health Behavior Change [3]
 - 3.1. Factors influencing health behavior
 - 3.1.1. Motivational factors
 - 3.1.2. Social & physical environmental factors
 - 3.1.3. Cultural factors
 - 3.2. Behavior change techniques
 - 3.2.1. Assessment
 - 3.2.2. Behavioral strategies
 - 3.2.3. Cognitive strategies
 - 3.2.4. Information transfer
 - 3.3. Risk factors
- 4.0. Disabled and Medically Compromised [8]
- 5.0. Epidemiology [7]
 - 5.1. Epidemiology of oral diseases
 - 5.1.1. Caries
 - 5.1.2. Periodontal disease
 - 5.1.3. Oral cancer
 - 5.2. Epidemiological measures
- 6.0. Prevention of oral diseases [1]
 - 6.1. Community and school-based methods
 - 6.2. Office-based methods
 - 6.3. Home-based methods

PATIENT MANAGEMENT

- 7.0. Evaluation of Dental Literature [4]
 - 7.1. Types of studies
 - 7.1.1. Descriptive
 - 7.1.2. Analytical
 - 7.1.3. Experimental
 - 7.2. Components of a scientific article
 - 7.3. Basic statistics
 - 7.3.1. Descriptive
 - 7.3.1.1. Central tendency
 - 7.3.1.2. Dispersion
 - 7.3.2. Inferential
- 8.0. Infection Control [2]
 - 8.1. Diseases and routes of transmission
 - 8.2. Barrier techniques
 - 8.3. Sterilization and disinfection
 - 8.4. Disposal of contaminated waste
- 9.0. Materials and Equipment Safety [2]
 - 9.1. Mercury hygiene
 - 9.2. Environmental contaminants
 - 9.3. Operatory equipment
 - 9.4. Chemicals
- 10.0. Professional Responsibility/Liability [12]
 - 10.1. Ethical principles
 - 10.2. Jurisprudence
 - 10.3. Informed consent
 - 10.4. Risk prevention/management
 - 10.5. Dental care delivery systems

PERIODONTICS [45]

- 1.0. Diagnosis [6]
- 2.0. Etiology [6]
 - 2.1. Periodontal microbiology
 - 2.2. Contributing factors
 - 2.2.1. Local factors
 - 2.2.2. Systemic factors
- 3.0. Pathogenesis [1]
- 4.0. Treatment Planning [6]
- 5.0. Prognosis [1]
- 6.0. Therapy [19]
 - 6.1. Rationale
 - 6.2. Scaling and root planing
 - 6.3. Surgery
 - 6.3.1. Gingival
 - 6.3.2. Mucogingival
 - 6.3.3. Osseous surgery
 - 6.3.4. Periodontal regeneration
 - 6.3.5. Implants
 - 6.4. Pharmacologic therapy
 - 6.5. Wound healing, repair, and regeneration
 - 6.6. Splinting and occlusal correction
 - 6.7. Special therapeutic problems
 - 6.7.1. Acute problems

- 6.7.2. Other
- 7.0. Prevention and Maintenance [6]

PHARMACOLOGY [34]

- 1.0. General Principles [5]
 - 1.1. Prescription writing, drug laws, and drug abuse
 - 1.2. Toxicity and drug interaction
 - 1.3. Dose response
 - 1.4. Mechanism of action
 - 1.5. Biotransformation
 - 1.6. Absorption, distribution, excretion
 - 1.7. Alternative (herbal) medications
- 2.0. Central Nervous System [4]
 - 2.1. Sedatives -- hypnotics and alcohols
 - 2.2. Antianxiety and conscious sedation agents
 - 2.3. Anticonvulsants -- anti-Parkinson
 - 2.4. Psychotropics (antipsychotic, antidepressant)
- 3.0. Autonomic [3]
 - 3.1. Adrenergics
 - 3.2. Cholinergics
 - 3.3. Blocking agents (adrenergic, cholinergic, etc)
- 4.0. Cardiovascular [4]
 - 4.1. Cardiac glycosides
 - 4.2. Antiarrhythmics
 - 4.3. Antihypertensives -- diuretics
 - 4.4. Anti-anginal agents
 - 4.5. Anticoagulants, coagulants, antihyperlipidemics
- 5.0. Local anesthetics [4]
 - 5.1. Basic pharmacology
 - 5.2. Vasoconstrictors
- 6.0. Chemotherapy [5]
 - 6.1. Antibacterials
 - 6.2. Antifungals
 - 6.3. Antivirals
 - 6.4. Antineoplastics
- 7.0. Endocrines/Immunosuppressants [2]
- 8.0. Analgesics [5]
 - 8.1. Opioids
 - 8.2. Non-opioids, nonsteroidal antiinflammatory agents
- 9.0. Antihistamines and Autocoids [2]

PROSTHODONTICS [45]

- 1.0. General Considerations [21]
 - 1.1. Diagnosis and treatment planning
 - 1.2. Preprosthodontic treatment
 - 1.3. Maxillomandibular relations
 - 1.4. Impressions and casts
 - 1.5. Esthetics and phonetics
 - 1.6. Restorative implantology
- 2.0. Complete and Removable Partial Denture Pros. [8]
 - 2.1. Design of prosthesis and mouth preparation
 - 2.2. Occlusion
 - 2.3. Dental materials
 - 2.4. Insertion and postinsertion
- 3.0. Fixed Partial Prosthodontics [16]
 - 3.1. Design of prosthesis and mouth preparation
 - 3.2. Occlusion
 - 3.3. Ceramic techniques
 - 3.4. Dental materials
 - 3.5. Insertion and postinsertion

