



The Biomedicine Expanded Content Outline

(Effective as of February 1, 2014)

Note to Candidate: This document serves as a guide to assist in examination preparation for candidates who have met NCCAOM eligibility requirements. Below is the content outline for the Biomedicine module, along with the competency statements.

Please note: In regards to Clean Needle Technique (CNT), the Biomedicine module focuses on universal precautions and emergency situations in comparison to the Acupuncture with Point Location module which focuses on actual needling and its emergencies (e.g., needle angle and depth).

DOMAIN I: Biomedical Model (90% of Total Exam)

A. Clinical Application of Biomedical Sciences (including anatomy, physiology, pathology, pathophysiology, etc.), Pharmacology, and Nutrients and Supplements **(30%)**

1. Biomedical sciences

- Differentiate normal and abnormal structures and functions of the body systems from the conventional biomedical perspective
- Recognize signs, symptoms, and morbidities associated with common medical conditions
- Demonstrate knowledge of medical terminology

2. Pharmacology

- Recognize functional classifications, mechanisms, side and adverse effects related to commonly used pharmaceuticals **(Refer to Appendix A: Pharmaceuticals)**
- Recognize routes of administration (e.g., intravenous, oral, subcutaneous)
- Demonstrate knowledge of the effects of the use of tobacco, alcohol, and other drugs of abuse
- Recognize common, known pharmaceutical-supplement interactions



3. Nutrients and supplements

- Recognize major classifications, known actions, and potential adverse effects related to commonly used nutrients and supplements (**Refer to Appendix B: Nutrients and Supplements**)
- Recognize signs and symptoms associated with abnormal levels of commonly used nutrients and supplements

B. Patient History and Physical Examination (25%)

Understand clinically relevant information gathered through history taking and physical examination.

Candidates are expected to understand all aspects of the physical examination process. They are not expected to be able to perform all aspects of the physical examination themselves.

1. Patient history*

- Conduct a medical interview to obtain patient history
- Organize information obtained during interview into appropriate sections of the patient history
- Distinguish the relevant findings obtained during history taking

*Patient History includes: chief complaint, history of present illness, allergies, past medical history, past surgical history, personal and social history, family history, current medications (prescription and non-prescription), herbs and supplements, review of systems

2. Physical examination

- Identify the components of the physical examination
- Recognize how each portion of the physical examination is performed
- Distinguish the relevant findings obtained from the physical examination



- a. General systems examination (e.g., vital signs, pulmonary, cardiovascular, gastrointestinal, integumentary)
- Understand relevant examination techniques such as observation, auscultation, and palpation as applied to each system
 - Recognize how each portion of the general systems examination is performed
 - Distinguish the relevant findings obtained from the general systems examination

b. Musculoskeletal examination

- Understand relevant examination techniques including, but not limited to, range of motion, muscle strength testing, deep tendon reflexes, dermatomal testing, and special tests including orthopedic tests
- Recognize how each portion of the musculoskeletal examination is performed
- Distinguish the relevant findings obtained from the musculoskeletal examination

c. Neurological examination

- Understand relevant examination techniques including, but not limited to, assessment of cognitive function, evaluation of cranial nerves, sensory and motor function, and reflexes
- Recognize how each portion of the neurological examination is performed
- Distinguish the relevant findings obtained from the neurological examination

3. Imaging, laboratory tests, and other medical studies

a. Imaging

- Understand commonly used medical imaging studies (e.g., x-ray, MRI, CT, PET, colonoscopy, cystoscopy, bronchoscopy)
- Recognize the significance of information gathered from imaging studies

b. Laboratory tests

- Understand commonly used medical laboratory tests** (e.g., complete blood count, basic metabolic panel, urinalysis, liver panel, cardiac panel, thyroid panel, pregnancy test, and reproductive hormones)

***normal ranges will not be tested*



- Recognize the significance of information gathered from laboratory tests
- c. Other medical studies
- Understand other commonly used medical studies (e.g., EMG, EKG)
 - Recognize the significance of information gathered from these studies

C. Clinical Assessment Process (30%)

Interpret clinically significant information gathered during history taking and physical examination to recognize pathological conditions. **(Refer to Appendix C: Medical Conditions)**

- Recognize abnormalities in the function of the body systems including, but not limited to, respiratory, cardiovascular, urogenital, reproductive, nervous, integumentary, musculoskeletal, and gastrointestinal systems
- Distinguish between relevant and non-relevant findings
- Recognize typical presentations of commonly encountered medical conditions
- Recognize commonly encountered ominous signs including, but not limited to, medical red flags, mental health red flags, and signs of abuse and trauma

D. Clinical Decision-Making and Standard of Care (5%)

Analyze information to determine appropriate patient management.

- Recognize medical conditions that may be treated without referral
- Recognize medical conditions that require co-management
- Recognize medical conditions that require a referral
- Differentiate the most appropriate type of referral*** (emergent, urgent, or routine), i.e., the timeframe within which the patient should be seen
- Recognize the conventional biomedical prognoses, management, and/or standard of care for common medical conditions **(Refer to Appendix C: Medical Conditions)**

***emergent (immediate) referral; urgent (24 - 48 hours) referral; routine (48 hours - 7 days) referral



DOMAIN II: Office Safety and Professional Responsibilities (10% of Total Exam)

Recognize and implement appropriate office safety standards and demonstrate knowledge of professional responsibilities.

A. Risk Management and Office Safety

- Recognize situations that require special care or emergency management (e.g., burns, seizures, falls, anaphylaxis)
- Implement emergency office protocols including contacting emergency services as appropriate

B. Infection Control

- Identify commonly encountered communicable diseases (e.g., hepatitis, HIV, tuberculosis)
- Identify modes of transmission (e.g., airborne, fecal-oral) and appropriate preventive measurements for common communicable diseases
- Recognize the appropriate office management of commonly encountered communicable diseases and hazardous situations
- Recognize and apply Universal Precautions

C. Federal Regulations

- Demonstrate knowledge of applicable Occupational Safety and Health Administration (OSHA) and other federal health agencies' requirements
- Demonstrate knowledge of applicable Health Insurance Portability and Accountability Act (HIPAA) requirements

D. Reporting and Record-Keeping

- Demonstrate knowledge of the required contents and maintenance of medical records
- Demonstrate knowledge of mandated reportable conditions (e.g., elder and child abuse, infectious diseases, bioterrorism)
- Demonstrate knowledge of the definition and purpose of ICD, CPT, E/M codes
- Demonstrate knowledge of insurance types and requirements (e.g., general liability, malpractice insurance)



E. Ethics and Professionalism

- Demonstrate knowledge of *NCCAOM*[®] *Code of Ethics* and other ethical principles (e.g., informed consent, conflict of interest, negligence, boundary violations)
- Communicate effectively and professionally with patients, the public, and other healthcare providers



Appendix A: Pharmaceuticals

Appendix A is a list of commonly used pharmaceutical categories. The exam will focus on but may not be exclusively limited to the list below.

- allergy/sinus medications
- angina medications
- antiasthmatic medications
- antibacterial medications
- anticancer medications
- anticoagulant medications
- antidepressants
- antidiabetic medications
- antidiarrheal medications
- antifungal medications
- antihyperlipidemic medications
- antihypertension medications
- antinausea medications
- anti-Parkinson medications
- antiprotozoal medications
- antipsychotics
- antiseizure medications
- antiviral medications
- appetite control/weight management medications
- cardiac medications
- central nervous system (CNS) stimulants/attention deficit medications
- cough medications
- drugs of abuse
- gastrointestinal medications
- hormonal replacement therapy
- immune modulators
- mood stabilizer medications
- non-steroidal anti-inflammatory drugs (NSAIDs)
- opioids
- osteoporosis medications
- sedatives, anxiolytic and sleep medications
- sexual dysfunction medications
- smoking cessation medications
- steroids
- stool softeners/laxatives
- thyroid medications
- topical skin medications



Appendix B: Nutrients and Supplements

Appendix B is a list of commonly used nutrients and supplements. The exam will focus on but may not be exclusively limited to the list below.

- amino acids (e.g., L-glutamine, lysine, choline)
- antioxidants (e.g., coenzyme Q10, selenium)
- bone health (e.g., glucosamine sulfate, chondroitin sulfate)
- digestive support (e.g., enzymes, fiber, probiotics)
- hormones (e.g., melatonin, wild yam, DHEA)
- minerals (e.g., calcium, magnesium, potassium)
- mood support (e.g., St. John's Wort, Sam E, 5 HTP)
- vitamins (e.g., A, B1-B12, C, D, E, K)
- Western herbs (e.g., saw palmetto, milk thistle)



Appendix C: Medical Conditions

The conditions (not system headings) listed below are categorized based on how frequently AOM practitioners reported seeing them in the clinical setting per the 2013 Job Analysis. This list is meant to serve as a study guide for the NCCAOM Biomedicine Examination Module to help prioritize focus of study. The exam will focus on but may not be exclusively limited to the conditions below.

The conditions marked with an asterisk (*) signify diseases commonly associated with **red flag signs and/or symptoms**. Candidates are strongly advised to familiarize themselves with these conditions and the red flag signs and symptoms associated with them.

CATEGORY 1 Frequently Seen Conditions

Cardiovascular

- *Arrhythmias (e.g., atrial fibrillation, premature ventricular contraction, tachycardia, bradycardia)
- *Blood pressure disorders (hypertension and hypotension)
- Atherosclerosis (e.g., coronary artery disease, peripheral vascular disease)

Endocrine and Metabolic conditions

- Thyroid disorders (e.g., Hashimoto's thyroiditis, Graves' disease)
- Pancreatic disorders (e.g., diabetes)
- Obesity
- Hyperlipidemia

Gastrointestinal conditions

- Gastroesophageal reflux disease
- Gastritis
- Inflammatory bowel disease (e.g., Crohn's disease, ulcerative colitis)
- Food sensitivity/allergies (e.g., celiac disease, lactose intolerance)
- Irritable bowel syndrome

Mental and Behavioral conditions

- *Mood disorders (e.g., depression, bipolar)
- Anxiety



Musculoskeletal conditions

- Affecting upper extremities (e.g., frozen shoulder, bicipital tendinitis, carpal tunnel syndrome, epicondylitis)
- Affecting lower extremities (e.g., meniscal injuries, compartment syndrome, bursitis)
- Affecting the axial structures (e.g., whiplash, disc herniation, spinal stenosis, spondylolisthesis, TMJ)
- Osteoarthritis
- Osteoporosis

Neurological conditions

- ***Stroke**
- ***Radiculopathies (e.g., nerve root, sciatica)**
- Peripheral neuropathy
- Headache (e.g., cluster, tension, migraine, sinus, trauma)
- Sleep disorders (narcolepsy, sleep apnea, insomnia)

Pulmonary conditions

- Asthma
- Respiratory tract infections (e.g., sinusitis, viral infections, strep throat, bronchitis, pneumonia)
- Allergies
- ***Pneumothorax**

Reproductive conditions

- Menstrual
- Infertility (e.g., polycystic ovarian syndrome, endometriosis)
- Menopause

Miscellaneous

- Multi-system conditions (Lyme disease, chronic fatigue, fibromyalgia, temporal arteritis)



CATEGORY 2 Moderately Seen Conditions

Cardiovascular

- *Myocardial infarction
- *Angina pectoris
- *Heart failure
- *Deep vein thrombosis
- Raynaud's disease
- *Aneurysms

Dermatological conditions

- Noncontagious skin conditions (cellulitis, shingles, acne, eczema, psoriasis, alopecia)

Gastrointestinal conditions

- Peptic ulcer (e.g., H. pylori, Campylobacter)
- *Diverticular disease (e.g., diverticulosis, diverticulitis)
- Hemorrhoids
- Gallbladder conditions (e.g., cholelithiasis, cholecystitis)

Hematological conditions

- Anemia
- Bleeding disorders

Infectious Disease

- Sexually transmitted infections
- Tuberculosis

- *Viral infections (e.g., infectious mononucleosis, influenza, meningitis, conjunctivitis)

Mental and Behavioral conditions

- Attention deficit disorder (ADD)/Attention deficit hyperactivity disorder (ADHD)
- Post-traumatic stress disorder (PTSD)

Neurological conditions

- *Transient ischemic attack (TIA)
- Parkinson's disease
- *Vertigo
- Bell's palsy
- Trigeminal neuralgia
- *Concussion and traumatic brain injury (TBI)

Pulmonary conditions

- Chronic obstructive pulmonary disease

Reproductive conditions

- Uterine (fibroids and bleeding)

Miscellaneous

- Autoimmune disorders [systemic lupus erythematosus (SLE), rheumatoid arthritis (RA)]



CATEGORY 3 Least Frequently Seen Conditions

Dermatological conditions

- *Contagious skin conditions (lice, fungal infections, scabies)
- *Skin cancers (e.g., basal cell, squamous cell, melanoma)
- Burns

Endocrine and Metabolic conditions

- Adrenal disorders (e.g., Cushing's, Addison's)

Gastrointestinal conditions

- *Appendicitis
- Hepatitis
- Cirrhosis
- *Pancreatitis

Hematological conditions

- Leukemia/lymphoma
- Hemochromatosis

Infectious Disease

- *Bacterial infections (e.g., staph, MRSA, impetigo, meningitis)
- Childhood infectious conditions (measles, mumps, rubella, pertussis)
- Parasitic infections
- Foodborne illness

Mental and Behavioral conditions

- Autism spectrum
- *Suicidality
- *Eating disorders (anorexia nervosa, bulimia nervosa)

Neurological conditions

- Multiple sclerosis (MS)
- Dementia (e.g., Alzheimer's disease)
- Epilepsy

*Oncology (lung, stomach, colon, pancreas, breast, prostate, uterine, bone, liver, cervical)

Ophthalmology/ENT

Reproductive conditions

- *Complications related to pregnancy
- Breast conditions (e.g., mass, mastitis)
- Male Infertility
- Erectile dysfunction (ED)
- Prostate conditions (benign prostatic hyperplasia, prostatitis)

Urinary/Renal conditions

- *Kidney Stones
- *Infections (UTI, cystitis, pyelonephritis)
- Incontinence



Biomedicine Bibliography

The Content Outline is the primary resource for studying for this examination. The purpose of this Bibliography is only to provide the candidate with suggested resources to utilize in preparation for the examination. Candidates should feel free to consider other resources that cover the material in the Content Outline.

There is no single text recommended by NCCAOM. All NCCAOM modules and examinations reflect practice in the United States as determined by the most recent job analysis.

NCCAOM's item writers and examination development committee members frequently use the following texts as resources; however, the sources used are not limited to the books listed here. The NCCAOM® does not endorse any third-party study/preparation guides.

Anzaldua, David. *An Acupuncturist's Guide to Medical Red Flags & Referrals*. Boulder, CO: Blue Poppy Enterprises, Inc., 2010.

Bickley, Lynn S. *Bates' Guide to Physical Examination and History Taking*. 11th ed. Philadelphia: Lippincott Williams & Wilkins Publishers, 2012.

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Katzung, Bertram G., Susan B. Masters, and Anthony J. Trevor, eds. *Basic and Clinical Pharmacology*. 13th ed. New York: McGraw Hill Medical, 2014.

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