



## The Biomedicine Content Outline

**Effective as of January 1, 2020**

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 examination.

**Please note:** In regard 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 (80% of Exam)

- A. Clinical application of biomedical sciences (e.g., anatomy, physiology, pathology, pathophysiology), pharmacology, and nutrients and supplements **(25%)**
  1. Biomedical sciences
    - a. Differentiate normal and abnormal structures and functions of body systems from a biomedical perspective
    - b. Recognize signs, symptoms, and morbidities associated with common medical conditions
  2. Pharmacology **(Refer to Appendix A: Pharmaceuticals)**
    - a. Identify functional classifications, mechanisms, side and adverse effects related to pharmaceutical categories
    - b. Identify routes of administration (e.g., intravenous, oral, subcutaneous)
    - c. Demonstrate knowledge of the effects of the use of tobacco, alcohol, and drugs of abuse
    - d. Identify clinically significant pharmaceutical-supplement interactions
  3. Nutrients and supplements **(Refer to Appendix B: Nutrients and Supplements)**
    - a. Identify major classifications, known actions, and potential adverse effects related to commonly used nutrients and supplements



- b. Recognize signs and symptoms associated with abnormal levels of commonly used nutrients and supplements

**B. Patient history and physical examination (20%)**

1. Patient history (e.g., chief complaint, allergies, medical history, personal and family history)

- a. Conduct a medical interview to obtain patient history
- b. Organize information obtained during interview into appropriate sections of the patient history

2. Physical examination

- a. Recognize how each portion of the physical examination is performed
- b. Identify the components and clinical significance of a general systems examination (e.g., vital signs, pulmonary, cardiovascular, gastrointestinal)

- 1. Identify relevant examination techniques such as observation, auscultation, and palpation as applied to each system
- 2. Recognize how each portion of the general systems examination is performed
- 3. Identify the clinically significant findings obtained from a general systems examination

c. Identify the components and clinical significance of a musculoskeletal examination

- 1. Identify relevant examination techniques (e.g., range of motion, muscle strength testing, and special tests including orthopedic tests)
- 2. Recognize how each portion of a musculoskeletal examination is performed
- 3. Identify the clinically significant findings obtained from a musculoskeletal examination

d. Identify the components and clinical significance of a neurological examination

- 1. Identify relevant examination techniques (e.g., assessment of cognitive function, evaluation of cranial nerves, sensory and motor function, dermatomal testing, and reflexes)
- 2. Recognize how neurological examinations are performed



3. Identify the clinically significant findings obtained from a neurological examination
3. Medical imaging, laboratory tests, and other diagnostic tests
  - a. Medical imaging
    1. Recognize the indications for common medical imaging (e.g., x-ray, MRI, CT, PET, colonoscopy, cystoscopy, bronchoscopy)
    2. Recognize the clinical significance of information from medical imaging
  - b. Laboratory tests
    1. Recognize the indications for common laboratory tests (e.g., complete blood count, basic metabolic panel, thyroid panel)
    2. Recognize the clinical significance of abnormal findings for medical laboratory tests
  - c. Other diagnostic tests
    1. Recognize the indications for common diagnostic tests (e.g., EMG, EKG)
    2. Recognize the clinical significance of information gathered from diagnostic tests
- C. Clinical assessment process (**Refer to Appendix C: Medical Conditions**) (30%)
  1. Recognize abnormalities in the functions of the body systems (e.g., respiratory, cardiovascular, urogenital, reproductive, nervous)
  2. Recognize the clinical significance of normal and abnormal findings
  3. Recognize typical presentations of commonly encountered medical conditions
  4. Recognize commonly encountered red flags/ominous signs (e.g., signs of stroke, heart attack, suicidal ideation, domestic abuse, trauma)
- D. Clinical decision-making and standard of care (5%)
  1. Recognize medical conditions that may be treated without referral
  2. Recognize medical conditions that require co-management
  3. Recognize medical conditions that require a referral
  4. Differentiate the most appropriate type of referral: emergent = immediate, urgent = 24-48 hours, or routine = 48 hours - 7 days
  5. Recognize the conventional biomedical prognoses, management, and/or standard of care for common medical conditions



## Domain II: Safety and Professional Responsibilities (20% of Exam)

- A. Risk management and safety
  - 1. Recognize situations that require special care or emergency management (e.g., burns, seizures, falls, anaphylaxis)
  - 2. Implement emergency protocols in practice (e.g., contacting emergency services)
  - 3. Recognize the purpose of professional insurances (e.g., general liability, malpractice insurance)
- B. Infection control
  - 1. Recognize common communicable diseases (e.g., influenza, hepatitis, HIV, tuberculosis)
  - 2. Identify modes of transmission of common communicable diseases (e.g., airborne, fecal-oral)
  - 3. Recognize and apply universal precautions
  - 4. Manage hazardous situations (e.g., coughing, bleeding, vomiting)
- C. Federal regulations
  - 1. Demonstrate knowledge of Occupational Safety and Health Administration (OSHA) and other federal health agencies' requirements
  - 2. Demonstrate knowledge of Health Insurance Portability and Accountability Act (HIPAA) requirements
- D. Reporting and record-keeping
  - 1. Maintain and release patient medical records in accordance with federal and state regulations
  - 2. Recognize and respond to mandated reportable conditions (e.g., elder and child abuse, infectious diseases, bioterrorism)
  - 3. Recognize the purpose of medical coding (e.g., ICD, CPT, E&M codes)
  - 4. Utilize medical coding (e.g., ICD, CPT, E&M codes)
- E. Ethics and professionalism
  - 1. Demonstrate knowledge of professional ethical standards (e.g., conflict of interest, negligence, boundary violations, scope of practice)



2. Provide informed consent related to patient care
  3. Communicate professionally with patients, the public, and other health care providers
- F. Integration of acupuncture and Chinese medicine with biomedicine
1. Communicate the differences and commonalities between acupuncture and Chinese medicine and biomedicine (e.g., correlation of diagnostic categories, differences in uses of organ systems)
  2. Explain acupuncture and Chinese medicine concepts using biomedical terminology for health care providers, patients, and the public



## Appendix A: Pharmaceuticals

*The exam will focus on but may not be exclusively limited to the list below.*

- allergy/sinus medications
- analgesic medications
- anti-angina medications
- anti-anxiety medications
- antiasthmatic medications
- antibacterial medications
- anticancer medications
- anticoagulant medications
- antidementia medications
- antidepressants
- antidiabetic medications
- antidiarrheal medications
- antifungal medications
- antihyperlipidemic medications
- antihypertension medications
- antinausea medications
- anti-Parkinson medications
- antipsychotics
- antiseizure medications
- antiviral medications
- birth control medications
- cannabinoids
- central nervous system (CNS) stimulants/attention deficit medications
- cough medications
- dermatological medications
- drugs of abuse
- fertility medications
- gastrointestinal medications
- hormonal replacement therapy
- immune modulators/biologics
- mood stabilizer medications
- non-steroidal anti-inflammatory drugs (NSAIDs)
- opioids
- osteoporosis medications
- sexual dysfunction medications
- sleep medications
- smoking cessation medications
- steroids
- stool softeners/laxatives
- thyroid medications
- weight management medications



## **Appendix B: Nutrients and Supplements**

*The exam will focus on but may not be exclusively limited to the list below.*

- amino acids (e.g., L-glutamine, L-lysine, choline)
- anabolic supplements (e.g., creatine)
- antioxidants (e.g., coenzyme Q10, selenium)
- bone/joint health (e.g., glucosamine sulfate, chondroitin sulfate)
- digestive support (e.g., enzymes, probiotics)
- energy support (e.g., ashwagandha, guarana)
- essential fatty acids (e.g., fish oils)
- herbal supplements (e.g., saw palmetto, valerian, turmeric)
- homeopathic remedies (e.g. arnica, nux vomica)
- hormonal support (e.g., melatonin, wild yam, DHEA)
- minerals (e.g., calcium, magnesium, potassium)
- mood support (e.g., St. John's Wort, SAMe, 5-HTP)
- sexual function support (e.g., yohimbe)
- vitamins (e.g., A, B1-B12, C, D, E, K)



## Appendix C: Medical Conditions

*The exam will focus on but may not be exclusively limited to the conditions below.*

### Cardiovascular conditions

- Aneurysm
- Angina pectoris
- Arrhythmia (e.g., atrial fibrillation, premature ventricular contraction, tachycardia)
- Atherosclerosis (e.g., coronary artery disease, peripheral vascular disease)
- Blood pressure disorders (hypertension and hypotension)
- Congestive heart failure
- Deep vein thrombosis
- Myocardial infarction
- Raynaud's phenomenon

### Dermatological conditions

- Burns
- Contagious skin conditions (e.g., lice, fungal infections, scabies)
- Noncontagious skin conditions (e.g., cellulitis, acne, eczema, alopecia)

### Endocrine and Metabolic conditions

- Adrenal disorders (e.g., Cushing's, Addison's)
- Diabetes Type I
- Hyperlipidemia
- Metabolic syndrome/insulin resistance (e.g., Diabetes Type 2)
- Parathyroid disorders
- Pituitary disorders
- Thyroid disorders (e.g., Hashimoto's thyroiditis, Graves' disease)

### Gastrointestinal conditions

- Appendicitis
- Cirrhosis
- Diverticular disease (e.g., diverticulosis, diverticulitis)
- Food sensitivity/allergies (e.g., celiac disease, lactose intolerance)
- Gallbladder conditions (e.g., cholelithiasis, cholecystitis)
- Gastritis
- Gastroesophageal reflux disease (GERD)
- Hemorrhoids





### Gastrointestinal conditions (cont.)

- Hepatitis
- Inflammatory bowel disease (e.g., Crohn’s disease, ulcerative colitis)
- Irritable bowel syndrome (IBS)
- Pancreatitis
- Peptic ulcer (e.g., H. pylori, Campylobacter)

### Hematological conditions

- Bleeding and coagulation disorders
- Disorders of platelets (e.g., thrombocytopenia)
- Disorders of red blood cells (e.g., anemia, polycythemia)
- Disorders of white blood cells (e.g., neutropenia)
- Hemochromatosis

### Infectious diseases

- Bacterial infections (e.g., staph, strep, MRSA, impetigo)
- Foodborne illness
- Lyme Disease
- Parasitic infections
- Sexually transmitted infections

### Infectious diseases (cont.)

- Tuberculosis
- Viral infections (e.g., measles, mumps, influenza)

### Mental and Behavioral conditions

- Addictions
- Anxiety disorders
- Attention Deficit Hyperactivity Disorder (ADHD)
- Autism spectrum
- Eating disorders (e.g., anorexia nervosa, bulimia nervosa)
- Mood disorders (e.g., depression, bi-polar disorder)
- Post-traumatic stress disorder (PTSD)
- Suicidality



### Musculoskeletal conditions

- Acute traumatic injuries
- Affecting lower extremities (e.g., meniscal injuries)
- Affecting the axial structures (e.g., disc herniation, TMJD)
- Affecting upper extremities (e.g., frozen shoulder)
- Bone density disorders
- Osteoarthritis

### Neurological conditions

- Bell's palsy
- Concussion and traumatic brain injury (TBI)
- Dementia (e.g., Alzheimer's disease)
- Epilepsy
- Headache (e.g., cluster, tension, migraine)
- Multiple sclerosis (MS)
- Parkinson's disease
- Peripheral neuropathy
- Post-herpetic neuralgia
- Radiculopathies (e.g., sciatica)
- Stroke
- Transient ischemic attack (TIA)
- Trigeminal neuralgia
- Vertigo

### Oncological conditions

- Cancer (e.g., organs, blood, bone, skin)
- Side effects secondary to cancer treatment (e.g., nausea, pain)

### Ophthalmic and Ear, Nose and Throat conditions

- Conditions of the eye (e.g., macular degeneration, conjunctivitis)
- Conditions of the ear (e.g., otitis media, tinnitus)
- Conditions of the nose and throat (e.g., strep throat, sinusitis, allergic rhinitis)

### Pulmonary conditions

- Asthma
- Respiratory tract infections (e.g., bronchitis, pneumonia)
- Pneumothorax
- Chronic obstructive pulmonary disease (COPD)



### Reproductive conditions

- Menstrual and uterine disorders (e.g., dysmenorrhea, endometriosis, fibroids)
- Female infertility [e.g., polycystic ovarian syndrome (PCOS)]
- Menopausal disorders
- Pregnancy (normal and with complications)
- Perinatal support (e.g., labor preparation, postpartum)
- Breast conditions (e.g., lumps, mastitis)
- Male infertility and erectile dysfunction (ED)
- Prostate conditions [e.g., benign prostatic hyperplasia (BPH), prostatitis]

### Urinary/Renal conditions

- Kidney stones
- Infections (e.g., UTI, cystitis, pyelonephritis)
- Incontinence
- Dysuria (e.g., painful urination, retention)

### Miscellaneous

- Multi-system conditions (e.g., chronic fatigue, fibromyalgia, temporal arteritis)
- Autoimmune disorders [e.g., systemic lupus erythematosus (SLE), rheumatoid arthritis (RA)]
- Sleep disorders (e.g., narcolepsy, sleep apnea, insomnia)



## Biomedicine Examination 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<sup>®</sup>. All NCCAOM<sup>®</sup> modules and examinations reflect practice in the United States as determined by the most recent job analysis.*

*NCCAOM<sup>®</sup>'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<sup>®</sup> does not endorse any third-party study/preparation guide.*

Anzaldúa, 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*. 12th ed. Philadelphia: Lippincott Williams & Wilkins Publishers, 2016.

Council of Colleges of Acupuncture and Oriental Medicine (Note as of June 2021 CCAOM is now Council of Colleges of Acupuncture and Herbal Medicine). *Clean Needle Technique Manual Best Practices for Acupuncture Needle Safety and Related Procedures*. 7th ed. Council of Colleges of Acupuncture and Oriental Medicine, 2015. [<http://www.ccaom.org/cntmanual.asp> (opens in new tab)]

Fischbach, Frances T. and Margaret A. Fischbach. *Fischbach's A Manual of Laboratory and Diagnostic Tests*. 10th ed. Philadelphia: Lippincott Williams & Wilkins Publishers, 2017.

Kailin, David C. *Quality in Complementary and Alternative Medicine*. Corvallis, OR: CMS Press, 2006.

Katzung, Bertram G. *Basic and Clinical Pharmacology*. 14th ed. New York: McGraw Hill Medical, 2017.

Magee, David J. *Orthopedic Physical Assessment*. 6th ed. St. Louis, MO: Saunders Elsevier, 2013.

Papadakis, Maxine A., Stephen J. McPhee, and Michael W. Rabow. *Current Diagnosis and Medical Treatment*. Columbus: McGraw-Hill Education. (Current Edition)



Porter, Robert S. (Ed.). *The Merck Manual of Diagnosis and Therapy*. 20th ed. West Point, PA: Merck & Co. Inc., 2018.

## Websites

*Federal regulations will take precedence over information found in other references. All links provided below opens in a new tab.*

Centers for Disease Control and Prevention (CDC) <https://www.cdc.gov/>  
 Infectious Disease  
 Infection Control  
 First Aid  
 NIOSH

Centers for Medicare & Medicaid Services (CMS) <https://www.cms.gov/>  
 Charting and Coding

Medline Plus <https://medlineplus.gov/>  
 Drugs, Herbs and Supplements

National Center for Complementary and Integrative Health (NCCIH) <https://nccih.nih.gov/>  
 Herbs at a Glance  
 Health Topics A-Z

Occupational Safety and Health Administration (OSHA) <https://www.osha.gov/>  
 Universal Precautions  
 Office Policies and Procedures

U.S. Department of Health & Human Services (HHS) <https://www.hhs.gov/>  
 Medical Records  
 Laws and Regulations  
 HIPAA

U.S. Department of Health & Human Services (HHS)  
 National Institutes of Health, Office of Dietary Supplements <https://ods.od.nih.gov/factsheets/list-all/>  
 Dietary Supplement Fact Sheets

World Health Organization (WHO) <https://www.who.int/>  
 ICD Coding