



NPLEX[®]

Naturopathic Physicians Licensing Examinations

Part II - Clinical Science Examinations: Blueprint and Study Guide

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Applicable to February 2024 NPLEX Exam Administration

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This *Blueprint and Study Guide* is intended to provide general information to anyone who will be taking NPLEX Part II - Clinical Science Examinations. The NPLEX Board reserves the right to make revisions as necessary. Examinees should consult the latest edition of the NPLEX Part II - *Blueprint and Study Guide* for the most up-to-date information regarding the examinations. NABNE sets and implements the policies that govern the administration of the NPLEX. Examinees should consult the latest edition of the NABNE *Examinee Handbook* at www.nabne.org for up-to-date information regarding these policies.

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INTRODUCTION

NPLEX, Inc., is an independent, nonprofit organization whose purpose is to prepare valid and reliable board-level licensing examinations for the naturopathic profession in the US and Canada. Agencies that regulate the practice of naturopathic medicine use NPLEX results in determining a candidate's eligibility for licensure. The exam development process is overseen by the NPLEX Council of Exam Chairs. NABNE (the North American Board of Naturopathic Examiners) verifies applicant eligibility to sit for the NPLEX, administers the NPLEX examinations, and reports NPLEX exam results to examinees and regulatory authorities.

Knowledge of both the biomedical sciences and the clinical sciences is necessary to ensure that the candidate for licensure has the knowledge necessary to practice safely. NPLEX prepares one Part I (Biomedical Science) examination and five Part II (Clinical Science) examinations. The Part I - Biomedical Science Examination is designed to measure a student's readiness to enter the clinical phase of training, assessing mastery of the competencies identified by biomedical science faculty from the accredited naturopathic medical colleges. The Part II - Clinical Science Examination(s) are designed to measure a graduate's readiness to practice naturopathic medicine, assessing mastery of the competencies derived from a job analysis of practicing naturopathic physicians. This *Study Guide* incorporates the results of the latest (2022) Core Clinical Science naturopathic practice analysis.

The NPLEX *Blueprint and Study Guide* contains the competencies and topics that the entry-level naturopathic doctor is expected to have mastered. Separate competencies and topics are provided for the Core Clinical Science Examination, and for the four clinical elective examinations [Minor Surgery, Elective Pharmacology, Parenteral Medicine (this is a new elective examination) and Acupuncture]. Other sections provide information on the structure of exam items with some examples of items, suggestions on how to study for and take an NPLEX examination, the post-examination scoring process, and a list of abbreviations the examinees is required to know.

This document is provided to help you create a study strategy for preparing to take the NPLEX Part II - Clinical Science Examinations. The list of competencies is not meant to be a literal structure for the examination. Questions might be asked on the examination which do not fit into a single body system, and items on the examination will not be in the same order as on the list of competencies.

NPLEX is committed to creating examinations that are free from implicit bias. While we recognize the impact of genetics, gender identity, disability, socioeconomic status, and cultural orientation on individuals, NPLEX cases do not include this information except when it is pertinent to diagnosis, treatment, or response to treatment. Specifically, NPLEX examinations do not indicate a patient's genetic ancestry unless it is pertinent to the case, and patient-preferred pronouns are specified and used only when gender identity might impact diagnosis, treatment, or management of the patient's case.

NPLEX PART II - CORE CLINICAL SCIENCE EXAMINATION (CCSE) OVERVIEW

Naturopathic medicine recognizes that the patient is a complex being with complex interacting issues (physical, social, environmental, mental, emotional, spiritual). An ND must be able to address this multifaceted nature of the patient's health. Clinical board-level examinations must assess the ND candidate's ability to *treat a patient*, not merely to *analyze a disease state*.

The CCSE competencies on the following pages reflect the results of the 2022 practice analysis of the naturopathic medical profession and provide the basis of items on the Core Clinical Science Examination. Pages 5 through 8 list the competencies that the graduate is expected to have mastered. The NPLEX Board has limited the numbers of conditions, tests, botanical medicines, homeopathic medicines, and pharmacotherapeutic agents the examinee is required to know to a representative sample. These "topics" are listed in pages 9 through 23, and include:

1. **Conditions** that are most frequently seen by a naturopathic doctor or which are so critical that the entry-level physician must know what to do when seeing a patient who has the condition;
2. **Orthopedic tests** the entry-level naturopathic doctor should be able to perform and interpret¹;
3. The **types of lab tests and diagnostic imaging studies** the entry-level naturopathic physician should be able to order and interpret appropriately;
4. The **botanical medicines** the entry-level naturopathic physician should be able to prescribe appropriately;
5. The **homeopathic medicines** an entry-level naturopathic physician should be able to prescribe appropriately; and
6. Examples of the **pharmacotherapeutic agents** an entry-level naturopathic doctor can expect patients to be taking.

The percentages provided (in parentheses) for the competencies and for the categories of conditions listed on the following pages are approximations, but provide a valid representation for study focus.

¹ Note: this list does not include non-orthopedic diagnostic tests an entry-level ND is expected to know how to perform and interpret.

NPLEX PART II - CORE CLINICAL SCIENCE EXAMINATION COMPETENCIES and BLUEPRINT WEIGHTINGS

- I. **DIAGNOSIS: Diagnose conditions using patient history, physical examination, clinical findings, lab test results, and diagnostic imaging results. Apply relevant research findings to patient diagnosis.** (Total weighting for DIAGNOSIS general exam area: 34-35%)
 - A. **Evaluate patients and diagnose common and critical conditions.** (20%)
(see list of conditions, pages 9 through 14)
 1. Take a medical and psychosocial history, and interpret findings.
 2. Perform a physical examination and interpret findings.
 3. Select orthopedic and other tests and interpret findings.
 4. Recognize psychiatric disorders. (see list, page 14)
 5. Identify the relevant risk factors for common and critical conditions.
 6. Identify and prioritize the signs and symptoms of common and critical conditions.
 7. Identify other conditions and co-morbidities associated with common and critical conditions.
 8. Generate a differential diagnosis and prioritize the likelihood of common and critical conditions.
 9. Delineate the pathogenesis of diseases, and identify possible etiologies of symptoms.
 10. Anticipate the possible complications and sequelae of common and critical conditions.
 11. Anticipate and appropriately communicate the prognosis for patients who have common and critical conditions.
 12. Identify when it is appropriate to refer patients to specialists; work with specialists in the co-management of patients.
 13. Appropriately use algorithms to increase accuracy when determining diagnoses.
 - B. **Use the results of common lab tests and imaging studies to evaluate and diagnose patient conditions.** (12-13%)
 1. Select necessary lab tests and imaging studies. (see list, page 16)
 2. Select appropriate specimens to collect, and prepare specimens for lab evaluation.
 3. Identify contraindications for and adverse effects of lab tests and imaging studies.
 4. Interpret results of lab tests and imaging studies.
 5. Identify factors that could interfere with results of lab tests and imaging studies.
 6. Assess patient progress using lab tests and imaging studies.
 - C. **Interpret, critique, and apply results of research studies in diagnosis and patient care.** (2-3%)
 1. Evaluate research methodology (e.g., study design, hypotheses, statistical analysis, etc.).
 2. Evaluate the validity of the research source (e.g., book, journal article, seminar, internet source) and the research process (e.g., peer review, potential for conflict of interest, potential for commercial bias, etc.).
 3. Evaluate the validity of research conclusions (e.g., sample bias, statistical significance, clinical significance, etc.).
 4. Incorporate valid findings into patient management.
 5. Apply the principles of evidence-informed clinical decision making in diagnosis and patient care.

II. **MATERIA MEDICA:** Develop treatment plans using substances from the Materia Medica to manage and co-manage patient care, and monitor patient progress. (Total weighting for MATERIA MEDICA general exam area: 19 to 20%)

- A. **Provide safe and effective patient care by applying principles of botanical prescribing.** (12.5%)
1. Evaluate the safety and efficacy of botanical medicine prescriptions. (see list, pages 17 through 19)
 2. Prescribe botanical medicines based on constituents, therapeutic effects, indications, contraindications, mechanisms of action, side effects, potentiators, inhibitors, toxicity, and drug and nutrient interactions.
 3. Select the most effective mode of administration of botanical medicines.
 4. Select and document appropriate posology.
- B. **Provide safe and effective patient care by applying principles of homeopathic prescribing.** (6.5%)
1. Identify when homeopathic medicines are safe and effective as part of the patient's treatment plan.
 2. Take a homeopathic case history, identifying characteristic mental, emotional, physical, and general symptoms.
 3. Prescribe homeopathic medicines by selecting the indicated remedy based on the materia medica, including the potency and dosage of the remedy. (see list, page 20)
 4. Manage acute and chronic homeopathic cases.

III. **OTHER MODALITIES:** Develop treatment plans using other therapeutic modalities guided by naturopathic philosophy to manage and co-manage patient care, and monitor patient progress. (Total weighting for OTHER MODALITIES general exam area: 28 to 29%)

- A. **Manage patient care by applying principles of clinical nutrition.** (10 to 11%)
1. Assess nutritional status.
 2. Educate patients about general nutrition and food sources of nutrients.
 3. Evaluate the safety and efficacy of nutritional interventions.
 4. Prescribe nutritional substances based on indications, contraindications, bioavailability, food sources, potential interactions, and requirements for macronutrients, micronutrients, amino acids, prebiotics, probiotics, and accessory nutritional factors.
 5. Prescribe therapeutic diets, foods, and supplements to optimize patient well-being.
 6. Prescribe therapeutic diets based on indications and contraindications, access to food and supplements, patient preferences, and awareness of cultural, ethnic, and religious impacts on patient care.

- B. Practice safe and effective patient care by applying principles of physical medicine. (8 to 9%)**
1. Evaluate the safety and efficacy of physical medicine modality prescriptions.
 2. Educate patients regarding prevention of musculoskeletal injury and prescription of home treatment for musculoskeletal conditions.
 3. Assess structural problems and perform indicated orthopedic tests. (see list, page 15)
 4. Identify the indications and contraindications for the use of and apply therapeutic devices including interferential, iontophoresis, phonophoresis, light therapy, pulsed electromagnetic field (PEMF), cold laser, microcurrent, sine wave, therapeutic ultrasound, transcutaneous electrical nerve stimulation (TENS), traction and compression, UV radiation, and diathermy.
 5. Identify the indications and contraindications for the use of, and perform other physical therapies including osseous and soft tissue manipulation, massage, hydrotherapy, irrigation methods, percussion techniques, postural drainage, and taping techniques.
 6. Prescribe therapeutic exercises including aerobic, resistance, stretching, balance, and rehabilitative exercises.
 7. Apply principles of physical medicine for pain management.
- C. Apply principles of health psychology and ethical behavior to address the relationship between illness and the mental, emotional, spiritual, and physical aspects of a person. (8 to 9%)**
1. Apply legal and ethical principles to physician-patient interactions (e.g., boundaries, confidentiality, informed consent, reporting, etc.).
 2. Promote diversity, equity, and inclusion in delivery of patient care (e.g., cultural competency, social determinants of health, accommodations for diverse functionality, overcoming communication barriers, etc.)
 3. Provide patient education to promote health and well-being (e.g., lifestyle choices, prevention of chronic disease, treatment adherence, motivational interviewing, etc.)
 4. Identify and address concerns related to development through all life stages (including family planning, infancy, childhood, adolescence, adulthood, geriatric, and end of life).
 5. Identify and address psychological factors in patient health (e.g., psychological manifestations of physical disease, physical manifestations of psychological conditions, etc.).
 6. Use validated psychological testing to assist in determining appropriate psychological interventions (including assessment of depression, anxiety, cognition, personality, substance use, and suicide risk).
 7. Apply basic counseling principles and techniques including physician-patient relationships, use of specific counseling therapies (e.g., cognitive behavioral, person-centered, family systems, marriage & family, etc.), and counseling techniques (e.g., EMDR, play therapy, etc.).
 8. Apply, recommend, or prescribe mind-body techniques to address psychological factors (e.g., meditation, biofeedback, mindfulness, breathing techniques, progressive relaxation, etc.).
 9. Apply socio-psycho-biological principles of pain management (e.g., pain response, psychoneuroendocrineimmunology, psychological interventions, etc.).
 10. Apply evidence-informed practice in counseling and patient care (e.g., ethical application of placebo and nocebo response, etc.).
 11. Recognize and address psychological crisis situations (e.g. suicidal ideation, acute psychiatric episodes, combative patients, domestic violence, etc.).
 12. Apply psychosocial management principles in the treatment of addictions or substance abuse (e.g., mechanisms of dependence and addiction, drug-seeking behavior, addiction-recovery programs, etc.).
 13. Practice legal risk-reduction behaviors in clinical practice (e.g., charting and documentation, use of chaperones, continuing education, professionalism, telehealth, etc.).

IV. OTHER (MEDICAL) INTERVENTIONS: Apply knowledge of medical interventions as indicated for patient care. (Total weighting for OTHER INTERVENTIONS general exam area: 20%)

A. Address emergency medical situations, perform acute-care medical procedures, and implement public health policies. (10%)

1. Assess patients experiencing medical, drug-related, and traumatic acute-care emergencies and treat, refer, or activate EMS as indicated.
2. Perform Basic Life Support/Cardiopulmonary Resuscitation.
3. Apply indicated sterilization, disinfection, and universal precautions.
4. Perform proper technique for venipuncture and apply principles of sterile technique, vein/site selection and preparation, injection technique (using syringe & needle), insertion technique, flow (drip) rate, and IV line patency.
5. Select and administer basic parenteral substances for IV rehydration.
6. Educate patients regarding public health and disease prevention, including prevention of communicable diseases and immunization. Follow and implement public health guidelines for epidemics/pandemics and for reporting communicable diseases and overdose.
7. Administer oxygen and other inhalation therapies.
8. Safely manage hazardous substances and materials including sharps and biohazardous waste disposal.
9. Apply principles of medical disaster preparedness.

B. Know the pharmacology of commonly prescribed drugs. (10%)

1. Describe primary actions, indications, contraindications, and adverse effects of pharmaceutical medications (including nutrient deficiencies), and potential interactions with botanical medicines, nutritional supplements, and other pharmaceuticals. (see list, pages 21 through 23)
2. Identify natural therapeutic interventions that have effects similar to commonly prescribed pharmaceuticals.
3. Identify and address polypharmacy issues including coordination of care between multiple prescribers.
4. Monitor therapeutic drug levels and assess for toxicity.
5. Recognize and address abuse of prescription medications and recreational substances.
6. Refer to and/or co-manage with prescribing practitioners to ensure patient safety.

NPLEX PART II - CORE CLINICAL SCIENCE EXAMINATION TOPICS

Conditions

1. Conditions of the blood and lymphatic systems (7%)

- A. **cancers** (leukemia [CLL, CML], Hodgkin and non-Hodgkin lymphoma, multiple myeloma)
- B. **infections and inflammations** (babesiosis, malaria, sepsis)
- C. **lymphatic system disorders** (lymphadenitis, lymphangitis, lymphedema)
- D. **red cell disorders** (glucose-6-phosphate dehydrogenase deficiency, hemochromatosis, sickle cell disease, alpha-thalassemia, beta-thalassemia, acute blood loss anemia, aplastic anemia, hemolytic anemia, anemia of chronic disease, and vitamin deficiency anemias [iron, vitamin B12, folate])
- E. **myeloproliferative disorders** (polycythemia vera, secondary polycythemia)
- F. **coagulation and platelet disorders** (disseminated intravascular coagulation, hemophilia A/factor VIII deficiency, immune thrombocytopenia, vitamin K deficiency, von Willebrand disease)
- G. **porphyrias** (acute intermittent porphyria, erythropoietic protoporphyria, porphyria cutanea tarda)

2. Conditions of the cardiovascular system (9%)

- A. **cardiac disorders** (acute coronary syndrome/myocardial infarction, cardiomyopathy, congestive heart failure [right-sided, left-sided], endocarditis, pericarditis, rheumatic heart disease)
- B. **cardiac rhythm disorders** (atrial fibrillation, atrial flutter, cardiac arrest, heart block, premature atrial and ventricular contractions, sinus bradycardia, supraventricular tachycardia, ventricular fibrillation, ventricular tachycardia)
- C. **valvular disorders** (regurgitation [aortic, mitral, pulmonic, and tricuspid], stenosis [aortic, mitral, pulmonic, and tricuspid], mitral valve prolapse)
- D. **blood pressure dysregulation** (hypertension, hypertensive crisis, hypotension)
- E. **circulatory system disorders** (aortic aneurysm, chronic venous insufficiency, gangrene, hypovolemic shock & dehydration, phlebitis, primary and secondary Raynaud phenomenon, stasis dermatitis and ulcers)
- F. **occlusive vascular disorders** (atherosclerosis, coronary microvascular disease, peripheral vascular disease [peripheral artery disease and intermittent claudication, thromboangiitis obliterans, embolism, thrombosis, thrombophlebitis])
- G. **trauma** (chest injuries with cardiovascular implications)

3. Conditions of the endocrine system (7%)

- A. **neoplasms** (adrenal, pancreatic, parathyroid, pituitary, thyroid)
- B. **hypothalamic and pituitary hormone disorders** (hyposecretion [panhypopituitarism, galactorrhea, growth hormone deficiency, diabetes insipidus], hypersecretion [acromegaly, Cushing disease, syndrome of inappropriate ADH secretion])
- C. **thyroid disorders** (Hashimoto thyroiditis, hyperthyroidism, hypothyroidism [primary, secondary, subclinical], non-toxic goiter)
- D. **parathyroid disorders** (hyperparathyroidism, hypoparathyroidism)
- E. **adrenal disorders** (Addison disease, Cushing syndrome, functional adrenal disorders, hyperaldosteronism)
- F. **pancreatic disorders** (diabetes mellitus type 2, reactive hypoglycemia, hyperinsulinemia, insulin resistance, metabolic syndrome)
- G. **other** (late-onset hypogonadism, menopause, PCOS)

4. **Conditions of the gastrointestinal and hepatobiliary systems (9%)**
- A. **neoplasms** (colorectal, esophageal, gallbladder, gastric, hepatic)
 - B. **infections and inflammation** (GI abscess, pancreatitis, peritonitis)
 - C. **esophageal disorders** (Barrett esophagus, eosinophilic esophagitis, esophageal motility disorder, esophageal strictures, esophageal varices, GERD, hiatal hernia)
 - D. **stomach disorders** (gastric ulcer, gastritis)
 - E. **hepatic disorders** (cirrhosis, hepatitis [A, B, C, non-infectious], non-alcoholic steatohepatitis, primary biliary cholangitis)
 - F. **gallbladder disorders** (cholecystitis, cholelithiasis)
 - G. **intestinal disorders** (appendicitis, autoimmune gluten enteropathy and gluten sensitivity, diverticulitis, diverticulosis, duodenal ulcer, inflammatory bowel disease [Crohn disease, ulcerative colitis], hernia [inguinal, umbilical], ileus, intestinal polyps, Meckel diverticulum, megacolon)
 - H. **rectal disorders** (anorectal strictures, cryptitis, fissures, fistula, hemorrhoids, polyps, proctitis, rectal prolapse)
 - I. **functional disorders of the GI and hepatobiliary system** (food allergies/intolerances, hypochlorhydria, intestinal dysbiosis [candidiasis and small intestinal bacterial overgrowth], irritable bowel syndrome)
 - J. **trauma** (injuries involving the abdominal cavity, poisoning)
 - K. **other disorders impacting public health** (acute and chronic diarrhea [bacterial and viral gastroenteritis, parasitic infections])
5. **Conditions of the head and neck (5%)**
- A. **neoplasms** (laryngeal, oral [gingival, tongue, tonsillar])
 - B. **infections** (cytomegalovirus, diphtheria, mastoiditis, mononucleosis/EBV)
 - C. **eye disorders** (acute closed-angle glaucoma, blepharitis, conjunctivitis, detachments [retinal, vitreous], keratitis, optic neuritis, orbital cellulitis, pterygium, retinal hemorrhage, retinopathy [diabetic, hypertensive], uveitis)
 - D. **ear disorders** (cholesteatoma, Ménière disease, otosclerosis, ruptured tympanic membrane, vertigo due to inner ear disorders [benign paroxysmal positional vertigo, labyrinthitis], other vestibular disorders)
 - E. **nose and sinus disorders** (allergic rhinitis, nasal polyps, sinusitis, sinus headache)
 - F. **mouth and throat disorders** (candidiasis, dental abscess, gingivitis, glossitis, herpangina, laryngitis, leukoplakia, parotitis, peritonsillar abscess, pharyngitis, retropharyngeal abscess, sialolithiasis, stomatitis, tonsillitis)
 - G. **trauma** (foreign bodies, non-neurological injuries)
6. **Conditions of the immune system (7%)**
- A. **immune deficiency disorders** (HIV/AIDS, IgA deficiency)
 - B. **autoimmune disorders** (ankylosing spondylitis, myasthenia gravis, polymyositis, reactive arthritis, rheumatoid arthritis, scleroderma, Sjögren syndrome, systemic lupus erythematosus, vasculitis [temporal/giant cell arteritis, Henoch-Schönlein purpura, necrotizing vasculitis, polyarteritis nodosa])
 - C. **hypersensitivity disorders** (allergies, anaphylaxis, angioedema, urticaria)
 - D. **other** (chronic fatigue syndrome, disorders of mitochondrial function [fibromyalgia])

7. **Conditions of the musculoskeletal system (9%)**
- A. **neoplasms** (chondroma, osteochondroma, osteoid osteoma, osteoma, osteosarcoma)
 - B. **infections and inflammations** (arthritis [psoriatic, septic], bursitis, degenerative disc disease, degenerative joint disease, gout, Lyme disease, tendinopathy)
 - C. **bone disorders** (Paget disease of the bone, osteomalacia, osteomyelitis, osteopenia, osteoporosis)
 - D. **shoulder and arm disorders** (adhesive capsulitis, rotator cuff injury, tendinopathy, thoracic outlet syndrome)
 - E. **elbow disorders** (epicondylitis, ulnar nerve entrapment)
 - F. **hand and wrist disorders** (carpal tunnel syndrome, de Quervain tenosynovitis, Dupuytren contracture, ganglion/synovial cyst)
 - G. **spinal disorders** (cervical disorders [discopathy, spondylosis, torticollis]; thoracic disorders [costochondritis, discopathy, facet syndrome]; lumbar and sacral disorders [discopathy, sciatica, spondylolisthesis]; postural disorders; spinal stenosis)
 - H. **hip and thigh disorders** (avascular necrosis of the femoral head, iliotibial band syndrome)
 - I. **knee disorders** (Baker cyst, ligament disorders, meniscal disorders, patellofemoral syndrome)
 - J. **leg and ankle disorders** (medial tibial stress syndrome)
 - K. **foot disorders** (functional disorders of the foot [pes planus/cavus], hallux malleus, hallux valgus, Morton neuroma, plantar fasciitis)
 - L. **trauma** (disc herniation, disc rupture, dislocation, fracture, separation, spasm, sprain, strain, tear, tendon rupture, whiplash)
 - M. **other** (complex regional pain syndrome, muscular dystrophy)
8. **Conditions of the nervous system (8%)**
- A. **neoplasms** (acoustic neuroma, astrocytoma, glioma, glioblastoma multiforme, meningioma)
 - B. **infections and inflammations** (acute inflammatory demyelinating neuropathy/Guillain-Barré syndrome, botulism, encephalitis, herpes zoster, meningitis, neuropathy, polio, rabies, radiculitis, tetanus)
 - C. **vascular disorders** (arteriovenous malformations, cerebral aneurysm, cerebrovascular accident, transient ischemic attacks)
 - D. **headaches** (cluster, migraine, tension, temporomandibular joint disorder)
 - E. **other neurological head disorders** (Bell palsy, vertigo not related to inner ear disorders, trigeminal neuralgia)
 - F. **seizure disorders** (partial/focal, general [absence, myoclonic, tonic, tonic-clonic, atonic])
 - G. **neurodegenerative diseases** (amyotrophic lateral sclerosis, Huntington disease, multiple sclerosis, Parkinsonism, peripheral neuropathy, post-polio syndrome)
 - H. **trauma** (causes of neurological injury [chronic traumatic encephalopathy, intracranial hemorrhage, shock, toxic exposure, traumatic brain injury])
9. **Conditions of the respiratory system (7%)**
- A. **neoplasms** (adenocarcinoma, mesothelioma, non-small cell carcinoma, Pancoast tumor, small cell/oat cell carcinoma)
 - B. **infections and inflammations** (blastomycosis, coccidioidomycosis, coronaviruses, histoplasmosis, influenza)
 - C. **bronchial disorders** (bronchiectasis, bronchitis)
 - D. **lung disorders** (abscess, acute respiratory distress syndrome, asthma, atelectasis, chronic obstructive pulmonary disease, empyema, pleural effusion, pleuritis/pleurisy, pneumoconiosis, pneumonia, pneumothorax, pulmonary edema, pulmonary embolism, pulmonary fibrosis, pulmonary hypertension, pulmonary infarction, sarcoidosis, tuberculosis)
 - E. **trauma** (airway obstruction, thoracic injuries with pulmonary implications)

10. **Conditions of the skin and nails (3%)**

- A. **cancerous and pre-cancerous lesions** (actinic keratosis, basal cell carcinoma, Kaposi sarcoma, melanoma, squamous cell carcinoma)
- B. **infections and inflammations** (acne vulgaris, candidiasis, carbuncle/furuncle, cellulitis, cimetosis, felon, folliculitis, herpes simplex type I, lichen planus, molluscum contagiosum, necrotizing fasciitis, onychomycosis, paronychia, pityriasis alba and rosea, rosacea, scabies, seborrheic dermatitis, tinea)
- C. **benign skin lesions** (acanthosis nigricans, acrochordons, lichenification, lipoma, sebaceous cysts, seborrheic keratosis, verrucae)
- D. **immune-mediated disorders** (bullous pemphigoid, atopic dermatitis, contact dermatitis, dermatitis herpetiformis, erythema multiforme, pemphigus, psoriasis, urticaria, vitiligo)
- E. **trauma** (bites, burns, foreign bodies, lacerations)

11. **Conditions of the genitourinary and reproductive systems (9%)**

- A. **neoplasms** (bladder cancer, cervical cancer, ovarian cancer, prostate cancer, seminoma, upper urinary tract cancer, uterine/endometrial cancer and masses [leiomyoma, endometrial adenocarcinoma, sarcoma], vulvar cancer)
- B. **infections** (pelvic inflammatory disease, toxic shock syndrome)
- C. **urinary tract disorders** (cystitis, glomerulonephritis, interstitial cystitis, nephrosclerosis, nephrosis/nephrotic syndrome, polycystic kidney, pyelonephritis, chronic kidney disease & acute kidney injury, renal glycosuria, urethritis, urolithiasis [cystolithiasis, nephrolithiasis])
- D. **uterine and pelvic disorders** (endometrial hyperplasia, endometriosis, endometritis, polyps, uterine prolapse)
- E. **vaginal disorders** (Bartholin cyst, colpocele, cystocele, dyspareunia, rectocele, vaginitis [bacterial, candidal, trichomonal])
- F. **ovarian disorders** (mittelschmerz, ovarian cysts)
- G. **cervical disorders** (cervical dysplasia, nabothian cysts)
- H. **vulvar disorders** (lichen sclerosus, vulvitis, vulvodynia)
- I. **menstrual disorders** (amenorrhea, dysmenorrhea, menorrhagia, metrorrhagia, oligomenorrhea, pre-menstrual syndrome)
- J. **female fertility disorders** (infertility due to cervical and uterine abnormalities, hormonal imbalances, immunologic incompatibility, metabolic abnormalities, nutritional deficiencies, ovarian failure, tubal obstruction)
- K. **male fertility disorders** (infertility due to ductal obstruction, ejaculatory abnormalities, hormonal imbalances, sperm and semen abnormalities)
- L. **erectile dysfunction** (endocrinologic, neurologic, pharmacologic, psychogenic, vascular)
- M. **penile and testicular disorders and benign masses** (balanitis, epididymitis, hematocele, hydrocele, orchitis, paraphimosis, phimosis, testicular torsion, spermatocele, varicocele)
- N. **prostatic disorders** (benign prostatic hyperplasia, prostatitis)
- O. **sexually transmitted infections** (chancroid, chlamydia, condylomata acuminata, condyloma lata, gonorrhea, herpes simplex type II, human papillomavirus, lymphogranuloma venereum, syphilis)
- P. **trauma** (foreign bodies, injuries)

12. **Conditions of the breasts and axillae (3%)**
- A. **neoplasms** (breast cancer [DCIS, LCIS, inflammatory, invasive], fibroadenoma, fibrocystic breast disease, Paget disease of the breast)
 - B. **infections** (mastitis)
 - C. **other** (gynecomastia)
13. **Conditions related to pregnancy (4%)**
- A. **masses** (gestational trophoblastic disease/hydatidiform mole)
 - B. **maternal infections** (group B streptococcus, toxoplasmosis)
 - C. **general pre/postnatal care and symptoms commonly associated with pregnancy** (constipation, hemorrhoids, leg cramps, nausea and vomiting, urinary tract infection, vaginitis, varicose veins)
 - D. **maternal antepartum disorders** (anemia, gestational diabetes, hyperemesis gravidarum, gestational hypertension, polyhydramnios, preeclampsia)
 - E. **obstetric emergencies** (abruptio placenta, eclampsia, ectopic pregnancy, placenta previa, postpartum hemorrhage, precipitous birth, pre-term labor, prolapsed cord, retained placenta, Rh factor incompatibility, threatened and spontaneous abortion)
 - F. **maternal postpartum disorders** (depression, lactation disorders, postpartum thyroiditis, symphysis pubis dysfunction)
14. **Conditions generally pertaining to pediatrics (5%)**
- A. **neoplasms** (leukemia [ALL, AML], Ewing sarcoma, neuroblastoma, nephroblastoma, osteosarcoma, retinoblastoma)
 - B. **infections and inflammations** (childhood exanthems [erythema infectiosum, roseola, rubella, rubeola, scarlet fever], encephalitis, coxsackievirus, herpangina, impetigo, meningitis, mumps, otitis media, pediculosis, pertussis, rheumatic fever, streptococcal pharyngitis, thrush, varicella)
 - C. **behavioral disorders** (attention deficit disorder/attention deficit hyperactivity disorder, conduct disorder, oppositional defiant disorder, pervasive developmental disorder, reactive attachment disorder, separation anxiety disorder, Tourette syndrome)
 - D. **congenital disorders** (anal stenosis, cerebral palsy, congenital hypothyroidism, Hirschsprung disease)
 - E. **developmental disorders** (autism spectrum disorders, cryptorchidism, epispadias, failure to thrive [due to atrial septal defect, coarctation of the aorta, neglect, patent ductus arteriosus, tetralogy of Fallot, or ventricular septal defect], hypospadias, learning disorders)
 - F. **gastrointestinal disorders** (colic, encopresis, functional constipation, functional diarrhea, intussusception, meconium ileus, pyloric stenosis)
 - G. **musculoskeletal disorders** (femoral anteversion, hip dislocation, internal tibial torsion, juvenile rheumatoid arthritis, osteochondrosis [Legg-Calvé-Perthes disease, Osgood-Schlatter disease], osteogenesis imperfecta, rickets, Scheuermann disease, scoliosis, subluxation of radial head)
 - H. **respiratory disorders** (asthma, bronchiolitis, laryngotracheobronchitis (croup), cystic fibrosis, epiglottitis, infant respiratory distress syndrome, respiratory syncytial virus)
 - I. **trauma** (abuse [emotional, physical, sexual])
 - J. **other** (dacrocystitis, Fanconi syndrome, diabetes mellitus type 1, hemangioma, plumbism, pediatric febrile seizures, trisomy 21)

15. **Conditions generally pertaining to geriatrics (5%)**

- A. **symptoms and concerns commonly associated with aging** (constipation, hearing impairment, iatrogenic illness, immobility, loss of balance and flexibility, muscle and joint pain, polypharmacy, pressure ulcers, undernourishment, malnourishment, urinary incontinence, urinary tract infections, vaginal atrophy, vaginal infections, vision impairment, mental health concerns [anxiety, depression, grief, mortality, social isolation])
- B. **circulatory disorders** (aneurysm, peripheral vascular disease)
- C. **dementia** (Alzheimer disease, non-Alzheimer dementia)
- D. **musculoskeletal disorders** (osteoarthritis, osteoporosis, polymyalgia rheumatica)
- E. **nervous system disorders** (cerebral vascular accident, Parkinson disease, transient ischemic attacks)
- F. **ocular disorders** (cataracts, glaucoma, macular degeneration)
- G. **trauma** (elder abuse, falls, fracture)

16. **Conditions that have psychiatric, psychological, or behavioral implications (3%)**

- A. **psychotic disorders** (brief reactive psychosis, delusions, hallucinations, paranoia, schizophrenia)
- B. **mood disorders** (bipolar disorder, cyclothymia, depression, dysthymia, mania, seasonal affective disorder)
- C. **cognitive mental disorders** (delirium, dementia)
- D. **anxiety disorders** (agoraphobia, generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, phobias, post-traumatic stress disorder)
- E. **somatoform and factitious disorders** (adjustment disorder with physical complaints, conversion disorder, eating disorders, hypochondriasis, malingering, Munchausen syndrome, Munchausen syndrome by proxy, somatic symptom disorder)
- F. **sexual disorders** (genito-pelvic pain/penetration disorder, pedophilic disorder, sadism/masochism, voyeuristic disorder)
- G. **personality disorders** (antisocial, avoidant, borderline, dependent, histrionic, narcissistic)
- H. **substance-related and addictive disorders** (alcohol, cannabis, caffeine, hallucinogens, nicotine, opioids, prescription drugs, recreational drugs)
- I. **non-substance-related compulsive disorders** (compulsive buying, gambling, hoarding, kleptomania, sex)
- J. **trauma** (domestic violence, incest, rape)
- K. **life stage issues** (life stage issues in pediatric, adolescent, adult, and geriatric populations)

NOTE: There will also be a few case clusters on the examination that are oriented specifically to responding to emergency medical scenarios.

Orthopedic Tests

1. Orthopedic tests: vertebral column

- A. Adam forward-bend test
- B. Adson and reverse Adson tests
- C. Braggard test
- D. Bechterew test
- E. cervical spine compression test
- F. cervical spine distraction test
- G. elevated arm stress test (Roos test)
- H. Hoover test
- I. hyperabduction test (Wright)
- J. Kemp test
- K. Lindner test
- L. Milgram test
- M. Minor test
- N. shoulder depression test
- O. Soto Hall test
- P. straight-leg raise test (Lasegue)
- Q. Valsalva test for spinal compression
- R. vertebral artery test

2. Orthopedic tests: shoulder

- A. Apley scratch test
- B. drop-arm test (Codman)
- C. glenohumeral apprehension tests
(posterior and anterior)
- D. Hawkins-Kennedy test
- E. Lippman test
- F. Neer test
- G. Speed test
- H. Yergason test

3. Orthopedic tests: wrist, hand, and elbow

- A. Cozen & reverse Cozen tests
- B. Finkelstein test
- C. Mill & reverse Mill tests
- D. Phalen test
- E. retinacular test
- F. Tinel test
- G. valgus/varus stress test

4. Orthopedic tests: hip and pelvis

- A. Ely test
- B. FABER (Patrick) test
- C. Gaenslen test
- D. Hibb test
- E. Nachlas test
- F. Ober test
- G. Ortolani click test
- H. pelvic rock test
- I. telescoping test
- J. Thomas test
- K. Trendelenburg test
- L. Yeoman test

5. Orthopedic tests: knee

- A. anterior/posterior drawer test
- B. Apley compression test
- C. Apley distraction test
- D. bulge test
- E. Lachman test
- F. McMurray test
- G. patellar apprehension test
- H. patellar ballottement test
- I. patellofemoral grind test
- J. valgus/varus stress test

6. Orthopedic tests: ankle and foot

- A. anterior/posterior drawer test
- B. dorsiflexion test
- C. forefoot adduction test
- D. metatarsal squeeze test (Morton)
- E. talar tilt test
- F. test for rigid or supple flat feet
- G. gastrocnemius-soleus squeeze test
(Thompson)
- H. tibial torsion test

Types of Laboratory Tests and Diagnostic Imaging Studies

1. **Urine**
 - A. routine urinalysis
 - B. special tests
2. **Hematology**
 - A. CBC
 - B. coagulation studies
 - C. blood typing
 - D. erythrocyte sedimentation rate
3. **Serum Tests**
 - A. electrolytes
 - B. chemistry
 - C. hormones
 - D. therapeutic drug monitoring
 - E. antibody testing
4. **Stool Analysis**
 - A. collection
 - B. gross analysis of stool
 - C. speciality tests
5. **Microbiology**
 - A. technique
 - B. types
6. **Pathology** (including specimen collection)
 - A. cytology
 - B. biopsy
7. **Immunology**
 - A. autoimmune
 - B. infectious diseases
 - C. immunological response tests
8. **Pulmonary Function**
 - A. tests
 - B. studies
9. **Diagnostic Ultrasonography**
 - A. musculoskeletal system
 - B. vascular system
 - C. tissue/organ systems
10. **Electrodiagnostic Tests**
 - A. cardiac system
 - B. musculoskeletal system
 - C. nervous system
11. **Radiography**
 - A. orthopedic
 - B. tissue/organ systems
12. **Other Imaging/Viewing Studies**
 - A. studies using radiation
 - B. nuclear medicine scanning tests
 - C. fiberoptic studies
 - D. magnetic resonance imaging (MRI)
 - E. angiography
13. **Toxicology**
 - A. toxic metals
 - B. pesticides/herbicides/solvents
 - C. pharmacotherapeutic agents
14. **Pregnancy and Neonatology**
 - A. pregnancy
 - B. neonatology
 - C. fertility

NOTE: Normal ranges for lab test results will be provided in the Core Clinical Science Examination.

Botanical Medicines

Alternate names for the same genus and/or species are in parenthesis.

Achillea millefolium	Capsella bursa-pastoris
Aconitum napellus	Capsicum frutescens
Actaea racemosa	Cassia angustifolia
(Cimicifuga racemosa)	(Senna alexandrina)
Aesculus hippocastanum	Caulophyllum thalictroides
Allium cepa	Ceanothus americanus
Allium sativum	Centella asiatica
Aloe vera	Chamaelirium luteum
Althea officinalis	Chelidonium majus
(Althaea officinalis)	Chionanthus virginicus
Angelica sinensis	Cineraria maritima
Arctium lappa	Cinnamomum zeylanicum
Arctostaphylos uva-ursi	Coleus forskohlii
Arnica montana	Commiphora mukul
Artemisia annua	Commiphora myrrha
Artemisia absinthium	(Commiphora molmol)
Artemisia vulgaris	Convallaria majalis
Asclepias tuberosa	Cordyceps sinensis
Aspidosperma quebracho	Corydalis ambigua and spp.
Astragalus membranaceus	Crataegus oxyacantha
Atropa belladonna	(Crataegus laevigata)
Avena sativa	Curcuma longa
Bacopa monnieri	Cynara scolymus
Baptisia tinctoria	Datura stramonium
Berberis aquifolium	Digitalis purpurea
(Mahonia aquifolium)	Dioscorea villosa
Berberis vulgaris	Echinacea angustifolia
Boswellia serrata	Echinacea pallida
Bryonia alba	Echinacea purpurea
Bryonia cretica dioica	Eleutherococcus senticosus
Calendula officinalis	Ephedra sinica
Camellia sinensis	Equisetum arvense
Cannabis sativa	Eschscholzia californica

Eucalyptus globulus
Eupatorium perfoliatum
Eupatorium purpureum
Euphrasia officinalis
 (Euphrasia stricta)
Foeniculum vulgare
Fucus vesiculosus
Galium aparine
Ganoderma lucidum
Gelsemium sempervirens
Gentiana lutea
Geranium maculatum
Ginkgo biloba
Glycyrrhiza glabra
Grindelia robusta
Gymnema sylvestre
Hamamelis virginiana
Harpagophytum procumbens
Humulus lupulus
Hydrangea arborescens
Hydrastis canadensis
Hyoscyamus niger
Hypericum perforatum
Inula helenium
Iris versicolor
Juglans nigra
Juniperus communis
Larrea tridentata
Leonurus cardiaca
Leptandra virginica
 (Veronicastrum virginicum)
Ligusticum porteri
Ligustrum lucidum
Linum usitatissimum
Lobelia inflata
Lomatium dissectum
Lycopus virginicus

Matricaria chamomilla
 (Matricaria recutita)
Medicago sativa
Melaleuca alternifolia
Melissa officinalis
Mentha piperita
Mitchella repens
Momordica charantia
Olea europaea
Panax ginseng
Panax quinquefolius
Passiflora incarnata
Pausinystalia yohimbe
Phytolacca americana
Piper methysticum
Piscidia erythrina
 (Piscidia piscipula)
Plantago major
Podophyllum peltatum
Prunus serotina
Prunus africana
 (Pygeum africanum)
Pulsatilla vulgaris
Quercus rubra
Rauwolfia serpentina
Rhamnus frangula
Rhamnus purshiana
 (Frangula purshiana)
Rhodiola rosea
Ricinus communis
Rosmarinus officinalis
Rubus idaeus
Rumex crispus
Salix alba
Salvia officinalis
Sambucus nigra
Sanguinaria canadensis

Schisandra chinensis
Scutellaria baicalensis
Scutellaria lateriflora
Selenicereus grandiflorus
 (Cactus grandiflorus)
Serenoa repens
Silybum marianum
Smilax spp.
Solidago spp.
Symphytum officinale
Tanacetum parthenium
Tanacetum vulgare
Taraxacum officinale
Theobroma cacao
Thuja occidentalis
Thymus vulgaris
Tilia europaea
Tribulus terrestris
Trifolium pratense
Tussilago farfara

Ulmus rubra
 (Ulmus fulva)
Urtica dioica
Usnea barbata
Vaccinium myrtillus
Valeriana officinalis
Veratrum album
Veratrum viride
Verbascum thapsus
Verbena officinalis
Viburnum opulus
Viburnum prunifolium
Vinca major
Vinca minor
Viscum album
Viscum flavescens
 (Phoradendron serotinum)
Vitex agnus-castus
Withania somnifera
Zingiber officinale

Homeopathic Medicines

aconitum napellus	lachesis
allium cepa	ledum
anacardium	lycopodium
antimonium tartaricum	magnesia phosphorica
apis mellifica	medorrhinum
arnica montana	mercurius vivus
arsenicum album	natrum muriaticum
aurum metallicum	natrum phosphoricum
baryta carbonica	natrum sulphuricum
belladonna	nitricum acidum
bryonia	nux vomica
calcareo carbonica	phosphorus
cantharis	phytolacca
carbo vegetabilis	platina
causticum	podophyllum
chamomilla	psorinum
cina	pulsatilla
cinchona officinalis (china)	pyrogenium
colocynthis	rhus toxicodendron
conium	rumex crispus
drosera	ruta graveolens
equisetum	sanguinaria
eupatorium perfoliatum	sepia
euphrasia	silicea
ferrum phosphoricum	spongia tosta
gelsemium	staphysagria
glonoinum	stramonium
graphites	sulphur
hepar sulphuris	symphytum
hyoscyamus	syphilinum
hypericum	tabacum
ignatia amara	thuja occidentalis
ippecacuanha	tuberculinum
kali bichromicum	urtica urens
kali carbonicum	veratrum album

Drugs on the Core Clinical Science Examination

[NOTE: Because brand names in Canada and the United States are frequently different, only generic names will be used on both this blueprint and the examination. Some generic names are also different, and these will be noted as U.S. name/Canadian name.]

5-fluorouracil	carvedilol
acetaminophen	cefepime
adalimumab	ceftriaxone
albuterol (salbutamol)	ceftaroline
alendronate	cefuroxime
allopurinol	celecoxib
alprazolam	cephalexin
amantadine	ciprofloxacin
amiodarone	clarithromycin
amitriptyline	clindamycin
amlodipine	clonidine
amoxicillin	clopidogrel
anastrozole	cocaine
apixaban	codeine
aripiprazole	colchicine
aspirin	cyclobenzaprine
atenolol	cyclosporine
atezolizumab	deferoxamine
atorvastatin	dexamethasone
atropine	dextroamphetamine
azithromycin	dextromethorphan
benzoyl peroxide	DHEA
bisacodyl	diazepam
bismuth subsalicylate	dicyclomine
bromocriptine	digoxin
bupropion	diphenhydramine
buspirone	DMPS
caffeine	DMSA
calcipotriol	docusate
canagliflozin	donepezil
cannabis	doxorubicin
capsaicin	doxycycline
carbamazepine	dulaglutide
carisoprodol	edetate calcium disodium

epinephrine (adrenalin)
escitalopram
esomeprazole
estradiol
estriol
estrogens, conjugated
estrone
exenatide
finasteride
fluconazole
fluoxetine
fluticasone (nasal spray and inhaled)
furosemide
gabapentin
gemfibrozil
glyburide
guaifenesin
haloperidol
heparin
hepatitis A and B vaccine
heroin
HPV quadrivalent
hydrochlorothiazide
hydrocodone
hydrocortisone
hydroxychloroquine
hydroxyzine
H. influenza type B conjugate
ibuprofen
influenza vaccine
insulin - glargine, lispro, regular
interferon alfa 2 (INF-2)
interferon beta 1
ipilimumab
ipratropium bromide
isoniazid
isotretinoin
ketamine
latanoprost (ophthalmic solution)
levodopa-carbidopa

levonorgestrel (IUD)
levothyroxine
liothyronine
liraglutide
lisinopril
lithium
loperamide
loratadine
lugol solution
mebendazole
medroxyprogesterone acetate
melatonin
meningococcal polysaccharide
metformin
methadone
methotrexate
methylphenidate
methylprednisolone
metoclopramide
metoprolol
metronidazole
misoprostol
MMR vaccine
modafinil
mometasone
montelukast
morphine
mupirocin
naloxone
naltrexone
naproxen
nicotine (transdermal)
nitrofurantoin
nitroglycerin
norelgestromin/ethinyl estradiol (patch)
norgestimate/ethinyl estradiol (oral)
nystatin
ondansetron
oseltamivir
oxycodone

oxymetazoline (nasal spray)	selenium sulfide
oxytocin (pitocin)	sildenafil
paclitaxel	sitagliptin
pembrolizumab	sodium phosphate enema
penicillamine	spironolactone
penicillin	sucralfate
pentoxifylline	sulfasalazine
permethrin	sumatriptan
phenazopyridine	tamoxifen
phenelzine	tamsulosin
phentermine	terbinafine
phenylephrine	testosterone
phenytoin	tetanus (DTaP and Tdap) vaccines
pioglitazone	tiotropium bromide
pneumococcal polyvalent	tofacitinib
polio vaccine	tolterodine
potassium chloride	trastuzumab
PPD skin test	trazodone
pramipexole	triamcinolone
prednisone	trimethoprim/sulfamethoxazole
pregabalin	triple antibiotic (bacitracin, neomycin, polymyxin B)
pregnenolone	USP thyroid
prochlorperazine	valacyclovir
progesterone (oral micronized)	valsartan
propranolol	varenicline
propylthiouracil	varicella vaccine
pseudoephedrine	venlafaxine
raloxifene	vinblastine
RGE vaccine	warfarin
rifampin	zidovudine (AZT)
risperidone	zoster vaccine
rivastigmine	zolpidem
salmeterol	

NOTE: Although individual fluids (e.g., Ringer's lactate, D5-W etc.) are not specified above, the examinee is responsible for understanding principles for using fluids administered parenterally in acute-care interventions.

NPLEX PART II - CORE CLINICAL SCIENCE EXAMINATION FORMAT

The 400-item NPLEX Part II - Core Clinical Science Examination will be administered in three sections over the course of 3 days (approximately 130 items - 3½ hours per day). The examination will consist of 75 to 85 case clusters in which you will be presented with a clinical summary of the case, then asked four to six questions pertaining to that case. For example, you might be asked to identify the conditions that would be included in a differential diagnosis; to select an appropriate orthopedic test, lab test, or diagnostic imaging study; to evaluate and prescribe treatment options in one of the therapeutic modalities; to describe the correct technique for performing a medical procedure; to know which botanical medicines you should not prescribe given the drugs the patient takes; to indicate appropriate responses to patient presentations or concerns; etc.

Approximately 30 to 35% of the questions on the Part II - Core Clinical Science Examination will test your ability to diagnose common conditions (listed on pages 9 through 14 of this guide) using physical examination, clinical assessment, and the results of lab tests and imaging studies, as well as your ability to understand and interpret research studies. Approximately 18 to 20% of the questions will test your knowledge of Materia Medica (see list of botanical medicines beginning on page 17 and list of homeopathic medicines on page 20). Approximately 28 to 30% of the questions will test your knowledge of other modalities applied using naturopathic principles, including clinical nutrition, physical medicine, and psychology. Approximately 20% of the questions will test your knowledge of medical interventions, including emergency medicine and basic medical procedures, and pharmacotherapeutic agents (see list of drugs beginning on page 21). Within these percentage breakdowns, questions will test the general knowledge needed to practice safely as a naturopathic doctor.

An examination can test only a sample of your knowledge. The sample of items on an NPLEX examination is a stratified sample, meaning that it has been designed to be representative of the knowledge an entry-level physician must have. On the actual examination, however, not every case will have every type of question associated with it.

The examples on the following pages do not reflect the percentages indicated above; they are intended only to give you an idea of the types of questions you may expect to encounter. Sometimes the diagnosis question will be the first question after the clinical presentation. However, because the treatment questions are designed to be answered based on the presentation and not on the correct naming of the condition, for some case clusters the diagnosis question will not be asked until some other point in the case cluster. These examples of case clusters are neither inclusive, nor are they exhaustive of item formats; however, a review of all the item examples will provide a good indication of the types of questions that may be asked on the examination.

NOTE: A “SAD diet” refers to an omnivorous diet that includes high amounts of simple carbohydrates, saturated fats, and refined foods.

Example Case #1

PATIENT: 28-year-old male; 5'10" (177.8 cm), 168 lbs (76.2 kg)

PRESENTATION: Four weeks after an extended trip to the Middle East, Africa, and Europe, the patient presents with fever, malaise, mild nausea, and occasional watery diarrhea. Onset was 1 week ago. He has been experiencing night sweats, and this week he has had several afternoon episodes of chills, followed by fever, headache, and diaphoresis. The episodes last several hours, then he feels better. Before his trip, he received all recommended vaccinations and took a prophylactic antimalarial drug. While he was traveling, he had several insect bites on his forearms, but he says these quickly resolved on their own.

MEDICAL HISTORY: His health history is unremarkable other than for minor childhood illnesses, including varicella and strep pharyngitis.

PSYCHOSOCIAL: He lives alone and is not in a long-term relationship. He is a college graduate and is currently looking for a job.

HEALTH HABITS: He eats an omnivorous diet that includes fresh organic fruits and vegetables, but he often eats sandwiches made from processed meats. When he is in a hurry, he skips meals and eats protein bars. He drinks coffee only in the mornings. He normally works out three times per week, but since he returned home, he has had less energy for exercise. When he was in college, his alcohol consumption was sometimes excessive, but now he has only one or two drinks when he goes out on weekend nights. He admits that on occasion, he has unprotected sex.

SUPPLEMENTS: He takes sublingual vitamin B₁₂ before he works out.

MEDICATIONS: loratadine, which he uses only occasionally

ALLERGIES: pollens

FAMILY HISTORY: His parents both have hypertension, and his mother has migraines.

VITAL SIGNS: His temperature is 99.3°F (37.3°C), BP is 110/60 mmHg, heart rate is 88 bpm, and respiratory rate is 12/min.

PHYSICAL EXAMINATION: He appears lethargic, and his hands feel clammy to the touch. On palpation, he has tenderness in the RUQ, LUQ, and descending colon.

PRELIMINARY LAB RESULTS:

LAB TEST	U.S. VALUE	U.S. RANGE	IU VALUE	IU RANGE
RBC	4.2 x 10 ⁶ /μL	4.6 - 6.2 x 10 ⁶ /μL	4.2 x 10 ¹² /L	4.6 - 6.2 x 10 ¹² /L
hgb	12.0 g/dL	13.8 - 17.2 g/dL	120 g/L	130 - 170 g/L
hct	38%	41 - 50%	0.38	0.41 - 0.50

Thick and thin Giemsa-stained smears with oil immersion magnification (1000x) show oval-shaped erythrocytes containing trophozoites with Schüffner dots and schizonts, indicating infection with *Plasmodium ovale*.

Chemistry panel is WNL.

Urinalysis is WNL.

HIV testing is negative.

DIAGNOSTIC IMAGING: Diagnostic imaging studies were not performed at this appointment.

1. Plasmodium infection affects which cell type(s)?
 - A. RBCs only
 - B. lymphocytes
 - C. RBCs and hepatocytes
 - D. goblet cells of the stomach and villi of the small intestine
2. The dark colored urine that is sometimes seen in patients being treated for Plasmodium infection is indicative of _____.
 - A. precipitated urates in an acid urine
 - B. relative dehydration due to watery stools
 - C. abnormal concentration of the urine during episodes of high fever
 - D. free hemoglobin produced by hemolysis, and possible renal failure
3. Which botanical medicine is most indicated for his condition?
 - A. Smilax spp.
 - B. Viscum album
 - C. Artemisia annua
 - D. Asclepius tuberosa
4. He says that for the past few weeks he has had an aversion to being touched, and even light touch irritates him. This morning, a cat rubbed against his legs, and not only was the sensation distressing, but he found the presence of the cat frightening. Given the information in his case and these additional symptoms, which homeopathic medicine best fits his presentation?
 - A. nux vomica
 - B. podophyllum
 - C. china officinalis
 - D. arsenicum album
5. Which drug is most indicated for his infection?
 - A. isoniazid
 - B. mebendazole
 - C. metronidazole
 - D. hydroxychloroquine

Example Case #2

PATIENT: 46-year-old female; 5'6" (168 cm), 120 lbs (54.4 kg)

PRESENTATION: The patient presents with tenderness and swelling of her left calf. Onset was 6 days ago, the day after she ran a half-marathon. While she is in your office, she begins to experience shortness of breath and sharp, stabbing chest pain. Her chest pain is worse when she breathes deeply or coughs.

MEDICAL HISTORY: She has a long history of amenorrhea. For the past 3 months, she has experienced periods of increasing anxiety.

PSYCHOSOCIAL: She went through a difficult divorce 3 months ago and now lives alone. She works as a loan processor at a bank.

HEALTH HABITS: She eats a vegan diet. She usually runs 4 miles (6.4 km) per day, 6 days per week; however, when she is training for a marathon, she runs 10 miles (16.1 km) every day.

SUPPLEMENTS: a daily multivitamin supplement, *Eleutherococcus senticosus*, and for the past 5 days, a topical homeopathic analgesic cream for her calf pain

MEDICATIONS: a combination oral contraceptive for the past 6 years, loratadine for seasonal allergies

ALLERGIES: seasonal pollens and cat dander

VITAL SIGNS: Her temperature is 99.1°F (37.3°C), BP is 102/60 mmHg, heart rate is 96 bpm, and respiratory rate is 18/min.

PHYSICAL EXAMINATION: She appears anxious. You note mild right-sided pedal edema. Her right calf is slightly warm to the touch and tender to palpation. Pedal pulses are intact. On auscultation, you hear ectopic beats, decreased breath sounds, and mild crackles bilaterally. Oxygen saturation on room air is 93%.

PRELIMINARY LAB RESULTS: Lab tests were not ordered at the time of the initial evaluation.

DIAGNOSTIC IMAGING: Diagnostic imaging studies were not ordered at the time of the initial evaluation.

1. Given her presentation, what would most likely be found on physical examination?
 - A. a positive Homans sign
 - B. absence of a pleural rub
 - C. a negative Trendelenburg test
 - D. an elevated ankle blood pressure
2. The most likely diagnosis is _____, but you must also consider _____ in your differential.
 - A. pulmonary embolism; atelectasis
 - B. pulmonary embolism; myocardial infarction
 - C. myocardial infarction; peripheral vascular disease
 - D. myocardial infarction; gastrocnemius muscle partial tear

3. What is the most appropriate first step?
 - A. Refer her to the hospital for Doppler studies.
 - B. Activate EMS, and apply heat packs to her calf.
 - C. Administer oxygen and continue to observe her closely.
 - D. Activate EMS, and while waiting for paramedics to arrive, administer oxygen.
4. Which aspect of her clinical picture most likely predisposed her to this condition?
 - A. her use of loratadine
 - B. her recent increased anxiety
 - C. her long-term use of oral contraceptives
 - D. her excessive marathon training regimen
5. Which botanical medicine is most indicated to treat her calf pain?
 - A. *Crataegus oxyacantha*
 - B. *Viburnum prunifolium*
 - C. *Gelsemium sempervirens*
 - D. None of the above; botanical medicine would only mask her symptoms and would not address the cause.
6. Her chest pain is worse with any movement, and her calf pain is better when she presses on it (which you discourage her from doing). She is becoming increasingly irritable. Given the information in her case and these additional symptoms, which homeopathic medicine best fits her presentation?
 - A. *bryonia*
 - B. *lycopodium*
 - C. *apis mellifica*
 - D. *arnica montana*
7. After she has been treated for her acute presentation and her condition has stabilized, which nutrient would be most indicated for her?
 - A. 5 mg of vitamin K, administered po
 - B. 300 mg of citrus bioflavonoids, administered po
 - C. 400 IU of topical vitamin E, massaged into her calf
 - D. 100 mg vitamin B6 and 500 mg of magnesium, administered IV push
8. To prevent recurrence of her condition, the most important lifestyle change she should make would be to:
 - A. engage in deep breathing exercises.
 - B. use a different form of birth control.
 - C. eat a more balanced diet that includes animal protein.
 - D. begin a more comprehensive stretching and warm-up routine when she exercises.

Example Case # 3

PATIENT: 67-year-old male, 5'10" (178 cm), 154 lbs (70 kg)

PRESENTATION: The patient presents with severe abdominal pain. Onset was gradual over the past 3 days, but the pain has been especially intense for the past 36 hours. During the past 4 to 6 days, he has had only two bowel movements.

MEDICAL HISTORY: He has been relatively healthy most of his life, but for the past 2 years he has had to get up three or four times per night to urinate. He has a 40-year history of constipation,

PSYCHOSOCIAL: He lives with his wife, to whom he has been happily married for 41 years.

He recently retired from an accounting firm where he was employed for 45 years.

HEALTH HABITS: He eats pancakes or whole wheat toast for breakfast, sandwiches made with processed meats for lunch, and fish or chicken with potatoes or pasta for dinner. He loves cheese. He drinks one cup of coffee at breakfast and one glass of red wine with dinner. So he can sleep at night without needing to get up to urinate, he drinks little water. His only exercise is walking his small dog twice per day.

SUPPLEMENTS: Serenoa repens 640 mg qd

MEDICATIONS: none

ALLERGIES: none known

FAMILY HISTORY: His father died of a stroke at age 91, his mother died from breast cancer at age 82, and his younger sister has osteopenia.

VITAL SIGNS: His temperature is 99.3°F (37.4°C), BP is 140/88 mmHg, heart rate is 96 bpm, and respiratory rate is 18/min and shallow.

PHYSICAL EXAMINATION: His abdomen is slightly distended and tympanic to percussion. You note LLQ guarding and tenderness to light pressure, and you palpate a small tender mass in his LLQ near the midline. There is no rebound tenderness, and obturator and psoas signs are negative.

PRELIMINARY LAB RESULTS:

TEST	U.S. VALUE	U.S. RANGE	IU VALUE	IU RANGE
RBC	$4.6 \times 10^6/\mu\text{L}$	$4.6 - 6.2 \times 10^6/\mu\text{L}$	$4.6 \times 10^{12}/\text{L}$	$4.6 - 6.2 \times 10^{12}/\text{L}$
WBC	$15.2 \times 10^3/\mu\text{L}$	$4.5 - 11 \times 10^3/\mu\text{L}$	$15.2 \times 10^9/\text{L}$	$4.5 - 11 \times 10^9/\text{L}$
eosinophils	$1.0 \times 10^3/\mu\text{L}$	$0 - 0.5 \times 10^3/\mu\text{L}$	$1.0 \times 10^9/\text{L}$	$0 - 0.5 \times 10^9/\text{L}$

DIAGNOSTIC IMAGING: Results of diagnostic imaging studies are pending.

1. Which diagnostic imaging procedure is most indicated?
 - A. CT scan of his abdomen
 - B. MRI of his lower abdomen
 - C. abdominal ultrasonography
 - D. barium enema with radiograph
2. The most likely diagnosis is _____, but you must also consider _____ in your differential.
 - A. bowel obstruction; gluten enteropathy and appendicitis
 - B. bowel obstruction; toxic megacolon and intussusception
 - C. diverticulitis; bowel obstruction and appendicitis
 - D. diverticulitis; toxic megacolon and inflammatory bowel disease

3. A clerk at a health food store recommended that he take *Rhamnus purshiana* and *Podophyllum peltatum* (1:1) 20 gtt bid for his constipation. What do you tell him regarding this formula?
- A. It could aggravate his abdominal pain.
 - B. It would be safe for him, but it would not address any of his symptoms.
 - C. It would alleviate his nocturia, but would not address his abdominal pain.
 - D. It would not be safe for him, as these two botanical medicines should not be used together.
4. To treat his pain, you prescribe _____ in the form of _____.
- A. *Ulmus rubra* (fulva); lozenges pc
 - B. *Mentha piperita*; a cold infusion ac
 - C. *Ricinis communis*; a warm pack qd
 - D. *Rhamnus purshiana*; a tincture 30 gtt tid
5. Which drugs would be commonly prescribed to treat his condition?
- A. prednisone and ciprofloxacin
 - B. loperamide and ciprofloxacin
 - C. ciprofloxacin and metronidazole
 - D. esomeprazole and metronidazole
6. Which dietary recommendation would be most appropriate?
- A. a bland diet for 2 weeks, with a gradual return to his typical diet
 - B. a high-protein diet for 2 weeks, followed by a moderate-protein diet
 - C. a soft, low-fiber diet for 1 month, followed by a high-fiber, whole-foods diet
 - D. a diet rich in complex carbohydrates for 1 month, followed by a high-fiber diet
7. After he has fully recovered from the acute stage of his condition, which supplements are most indicated?
- A. niacin and potassium
 - B. L-arginine and calcium
 - C. pyridoxine and wheat germ
 - D. L-glutamine and flax seed meal

Example Case #4

PATIENT: 4-year-old male; 3'5" (104.2 cm) [65th percentile], 40 lbs (18.2 kg) [80th percentile]

PRESENTATION: The patient presents with fever, malaise, sore throat, and a barking cough. His mother tells you that his symptoms began yesterday evening with a mild sore throat, but that this morning he is much worse.

MEDICAL HISTORY: He has been generally healthy except for an occasional URI. He had an adverse reaction to his first round of vaccinations, so his parents have not continued with the immunization schedule.

PSYCHOSOCIAL: He lives with his parents and his 2-year-old sister, and he attends preschool. He has many friends. He is very athletic for his age and likes to play soccer.

HEALTH HABITS: He eats a SAD diet, but he is not a picky eater and likes most vegetables.

SUPPLEMENTS: none

MEDICATIONS: none

ALLERGIES: penicillin

FAMILY HISTORY: unremarkable

VITAL SIGNS: His temperature is 101.6°F (38.7°C), BP is 100/62 mmHg, heart rate is 130 bpm, and respiratory rate is 30/min.

PHYSICAL EXAMINATION: He is pale and listless. When you ask him questions, he seems to not want to answer; when he does speak, his voice is hoarse. He has bilateral submandibular lymphadenopathy. On visual inspection of his oropharynx, you observe erythematous mucosa and the presence of a grey membrane covering his tonsils, and his breath is fetid. You hear soft expiratory wheezing, but there is no stridor or use of accessory muscles for breathing.

PRELIMINARY LAB RESULTS: Results of lab tests are pending.

DIAGNOSTIC IMAGING: Diagnostic imaging studies were not performed at this appointment.

1. Based on the tonsillar inflammation and the adherent grayish pseudomembrane, a presumptive diagnosis of diphtheria is made, which would be confirmed by _____.
 - A. positive biopsy of the pseudomembrane
 - B. epidemic pattern of infection with *C. diphtheriae* found in sewage
 - C. Gram stain of a sample obtained from nasopharyngeal and pharyngeal swabs showing club-shaped bacilli
 - D. lateral radiograph of the neck indicating an enlarged epiglottis protruding from the anterior wall of the hypopharynx (thumb sign)
2. When he swallows, he winces in pain. His mother says that since he became ill, he has been extremely irritable when disturbed. Given the information in his case and these additional symptoms, which homeopathic medicine best fits his presentation?
 - A. lachesis
 - B. euphrasia
 - C. hypericum
 - D. hepar sulphuris

3. If you prescribe _____, you would expect him to have improved immune function within 2 days; however, an excessive dosage could _____.
- A. Curcuma longa; cause a rash
 - B. Curcuma longa; exacerbate his malaise
 - C. Lomatium dissectum; cause a rash
 - D. Lomatium dissectum; exacerbate his malaise
4. During the recovery phase, would steam inhalation treatments be appropriate for him, and why or why not?
- A. Yes; steam inhalation would help loosen his bronchial congestion.
 - B. Yes; steam inhalation would relax the smooth muscle of his respiratory passages and suppress his cough.
 - C. No; steam inhalation would lead to fluid accumulation in his lungs.
 - D. No; steam inhalation is not indicated for the treatment of diphtheria.
5. He has had close contact with his sister, who is currently asymptomatic. She has had all her scheduled immunizations. What is the standard of care to prevent transmission of infection to her?
- A. The sister should receive prophylactic antibiotics.
 - B. The patient should be hospitalized and placed under quarantine for the remainder of the acute course of his illness.
 - C. Close surveillance of the sister should be maintained, and at the first signs of illness, she should be scheduled for an appointment.
 - D. No special precautions are required, as his sister is up-to-date on her vaccinations.
6. His parents tell you that since he has contracted diphtheria, they see no reason for him to receive the rest of the scheduled vaccinations. What do you most appropriately tell them?
- A. The child should be vaccinated, as the illness does not confer immunity.
 - B. The child does not need to have the remainder of the scheduled vaccinations for diphtheria, as having the illness has conferred immunity.
 - C. The child does not need to have the remainder of the scheduled vaccinations for diphtheria, but anyone who has had close contact with him, has never been vaccinated, and has not previously had diphtheria will need to be vaccinated.
 - D. The child does not need to have the remainder of the scheduled vaccinations for this condition, and others who have had close contact with him will also have acquired immunity from exposure to him, whether or not they contract diphtheria.
7. What do you tell the parents regarding their risk of infection?
- A. They will not become ill, as diphtheria causes symptoms only in children.
 - B. If it has been more than 10 years since their last Tdap vaccination, they should receive a booster.
 - C. As long as the child is immediately hospitalized under quarantine, they are not at risk of infection.
 - D. At this point, vaccination would serve no purpose; they should expect to experience a mild form of the illness.

Example Case #5

PATIENT: 55-year-old female, 5'4" (162.6 cm), 155 lbs (70.3 kg).

PRESENTATION: The patient presents with left shoulder pain. The pain is a continuous, diffuse aching in her shoulder when she is at rest; use of her left arm increases the severity of the pain. She cannot sleep on her left side due to the pain. She denies trauma to her shoulder or any prior episodes of the pain. Onset of the diffuse aching was 2 months ago, but the increase in severity of the pain with use of the arm began 10 days ago.

MEDICAL HISTORY: She has a history of hypothyroidism, which was diagnosed 2 years ago.

PSYCHOSOCIAL: She is single and lives alone with her dog. She is a self-employed author.

HEALTH HABITS: She eats a high-carbohydrate diet and particularly loves bread and pasta. She spends 4 to 6 hours per day at her computer. She does not exercise except to take her dog for a walk for 15 minutes, twice per day. For the past month, she has been unable to hold the dog's leash in her left hand.

SUPPLEMENTS: a daily multivitamin supplement

MEDICATIONS: USP thyroid 30 mg qd, acetaminophen 1,000 mg qid since the pain began

ALLERGIES: none known

VITAL SIGNS: Her temperature is 97.6°F (36.4°C), BP is 130/84 mmHg, heart rate is 80 bpm, and respiratory rate is 18/min.

PHYSICAL EXAMINATION: She is right-handed. Physical examination reveals point tenderness deep to the anterior deltoid of her left shoulder. She has moderately decreased active and passive ROM of her left shoulder girdle in all directions. Her cervical spine has normal ROM and her deep tendon reflexes are normal bilaterally. Valsalva test is negative. Cardiopulmonary auscultation and abdominal examination are unremarkable.

PRELIMINARY LAB RESULTS: Lab tests were not performed at this appointment.

DIAGNOSTIC IMAGING: Diagnostic imaging studies were not performed at this appointment.

1. The point tenderness she experiences suggests that there may be inflammation or injury to the _____. You confirm this by performing _____.
 - A. bicipital tendon; Neer test
 - B. bicipital tendon; Speed test
 - C. glenohumeral capsule; Neer test
 - D. glenohumeral capsule; Speed test
2. The most likely diagnosis is _____, but you must also consider _____ in your differential.
 - A. adhesive glenohumeral capsulitis; shoulder dislocation and pancreatitis
 - B. adhesive glenohumeral capsulitis; thoracic outlet syndrome and shoulder dislocation
 - C. bicipital tendonitis; and thoracic outlet syndrome and cholecystitis
 - D. bicipital tendonitis; adhesive glenohumeral capsulitis and partial thickness rotator cuff tear

3. A diagnosis of _____ would be supported if her symptoms were most aggravated by _____.
- A. bicipital tendonitis; abduction and external rotation
 - B. adhesive capsulitis; adduction and pronation of the arm
 - C. adhesive capsulitis; resisted flexion and supination of the arm
 - D. bicipital tendonitis; resisted flexion and supination of the arm
4. Is an exercise regimen to improve her range of motion indicated at this time, and if so, what would you recommend?
- A. No; exercise is contraindicated at this stage.
 - B. Yes; isometric shoulder exercises
 - C. Yes; “wall climbing” shoulder exercises
 - D. Yes; over-the-head free-weight lifting
5. Which botanical medicine is most indicated, and why?
- A. *Avena sativa*, for its potent analgesic effect
 - B. *Curcuma longa*, for its anti-inflammatory effect
 - C. *Piscidia erythrina*, for its high bioflavonoid content
 - D. *Harpagophytum procumbens*, for its analgesic effect
6. Which supplement would be most indicated to address her presentation?
- A. glucosamine, to increase IL-6
 - B. selenium, to regenerate connective tissue
 - C. bromelain, to act as an anti-inflammatory
 - D. probiotics, to enhance proteoglycan chemotaxis
7. She returns for a follow-up appointment 6 weeks later, and you determine that manipulation of her shoulder would be indicated to prevent recurrence of her condition. Before you perform thrust manipulation of the shoulder, you must make sure that she does not have _____.
- A. scoliosis
 - B. breast implants
 - C. an osteolytic bone lesion
 - D. a history of Hashimoto thyroiditis
8. If her condition does not improve after 2 months of treatment, which diagnostic imaging study should be done?
- A. MRI
 - B. CT scan
 - C. ultrasonography
 - D. radiographic studies

Example Case #6

PATIENT: 3-year-old male; 3'2" (96.5 cm) [63rd percentile], 30 lbs (13.6 kg) [31st percentile]

PRESENTATION: The patient presents with periumbilical pain. For the past 3 days he has eaten very little, and this morning he vomited. He has not passed a stool in 4 days, and his last bowel movement contained a small amount of bright red blood.

MEDICAL HISTORY: As an infant, he was treated for patent ductus arteriosus. He has a history of constipation, which seems to occur in conjunction with the bleeding.

PSYCHOSOCIAL: He is a well-adjusted preschooler who lives with his parents and two older siblings.

HEALTH HABITS: He is a fussy eater and prefers to eat pizza, macaroni and cheese, and sugary breakfast cereals. He likes to play outside, and he has been learning to ride a tricycle.

SUPPLEMENTS: a daily children's multivitamin supplement

MEDICATIONS: none

ALLERGIES: none known

FAMILY HISTORY: unremarkable

VITAL SIGNS: His temperature is 98.0°F (36.7°C), BP is 100/60 mmHg, heart rate is 106 bpm, and respiratory rate is 18/min.

PHYSICAL EXAMINATION: On auscultation, bowel sounds are diminished, and you hear a high-pitched "ping" to the right of the umbilicus. On palpation of this region, you detect a tender sausage-shaped mass.

PRELIMINARY LAB RESULTS: CBC and urinalysis are WNL.

DIAGNOSTIC IMAGING: Diagnostic imaging studies were not performed at this appointment.

1. The most likely diagnosis is _____, but you must also consider _____ in your differential.
 - A. toxic megacolon; appendicitis and biliary colic
 - B. toxic megacolon; intussusception and constipation
 - C. Meckel diverticulum; intussusception and appendicitis
 - D. Meckel diverticulum; acute gastroenteritis and biliary colic
2. Which imaging study would be used to definitively diagnose his condition?
 - A. PET scan
 - B. endoscopy
 - C. flexible sigmoidoscopy
 - D. plain-film abdominal radiography with IV contrast
3. He feels better when he is lying in a fetal position with a heating pad pressed to his abdomen. Given the information in his case and this additional symptom, which homeopathic medicine best fits his presentation?
 - A. colocynthis
 - B. lycopodium
 - C. nux vomica
 - D. staphysagria

4. Which botanical is indicated to help prevent esophageal irritation caused by his vomiting?
- A. Aloe vera sap, due to its anti-inflammatory effect
 - B. Zingiber officinale tincture, due to its anti-nausea effect
 - C. Mentha piperita infusion, due to its anti-spasmodic effect
 - D. None of the above; he should not receive anything by mouth.

OR A DIFFERENT FORMAT FOR THIS TYPE OF QUESTION WOULD BE:

5. Would Aloe vera be an appropriate botanical medicine to treat his condition, and if so, what part of the plant should be used?
- A. Yes; Aloe vera gel, due to its vulnerary effect.
 - B. Yes; Aloe vera saponins, due to their laxative effect.
 - C. Yes; Aloe vera sap, due to its anti-inflammatory effect.
 - D. No; Aloe vera in any form is contraindicated for him.
6. Which physiotherapeutic modality would be most appropriate for his condition?
- A. high-volt galvanism
 - B. castor oil fomentations
 - C. visceral manipulation of the descending colon
 - D. None of the above; he should be referred to a pediatric surgeon.

Example Case #7

PATIENT: 34-year-old male; 6'1" (185.4 cm), 210 lbs (95.3 kg), which is 15 lbs (6.8 kg) less than he weighed 2 months ago.

PRESENTATION: The patient presents with episodes of palpitations, SOB, and mild chest pain. During these episodes, he becomes diaphoretic, develops an occipital headache, and his heart rate and blood pressure become elevated. Onset was 2 months ago.

MEDICAL HISTORY: Two years ago, he was diagnosed with hypertension. Despite drug treatment, he continues to experience hypertensive episodes.

PSYCHOSOCIAL: He lives in a condominium with his girlfriend. He works as a computer programmer, and he volunteers to work with troubled youth 1 day per week. He has an active social life.

HEALTH HABITS: He eats a balanced vegetarian diet. He jogs 3 miles (5 km), 3 days per week. On weekend nights, he usually drinks two or three alcoholic beverages.

SUPPLEMENTS: a daily multivitamin supplement, coenzyme Q10 100 mg qd, fish oil 3 g qd

MEDICATIONS: lisinopril 20 mg qd, amlodipine 10 mg qd

ALLERGIES: cat dander and ragweed

FAMILY HISTORY: unremarkable

VITAL SIGNS: His temperature is 98.9°F (37.2°C), BP is 150/100 mmHg, heart rate is 110 bpm, and respiratory rate is 18/min.

PHYSICAL EXAMINATION: He is pale and diaphoretic, and his hands and feet are cold to the touch. Fundoscopic examination reveals an increased retinal arteriolar light reflex and flame hemorrhages, bilaterally. On cardiac auscultation, you hear a regular tachycardic rhythm, with no rubs, gallops, or murmurs. The point of maximal cardiac impulse is at the 6th intercostal space.

PRELIMINARY LAB RESULTS:

LAB TEST	U.S. VALUE	U.S. RANGE	IU VALUE	IU RANGE
TSH	1.2 IU/mL	0.5 - 5 IU/mL	1.2 mIU/L	0.5 - 5 mIU/L
glucose (fasting)	105 mg/dL	< 100 mg/dL	5.8 mmol/L	< 5.6 mmol/L

DIAGNOSTIC IMAGING:

Diagnostic imaging studies were not performed at this appointment.

1. Which diagnostic procedure would be most helpful to confirm the most likely diagnosis?
 - A. A radioactive iodine uptake test would be used to confirm the most likely diagnosis of hyperthyroidism.
 - B. A urinary 5-hydroxyindoleacetic acid (5-HIAA) test would be used confirm the most likely diagnosis of carcinoid tumor.
 - C. 24-hour urinary catecholamine and metanephrine tests would be used to confirm the most likely diagnosis of pheochromocytoma.
 - D. 24-hour urinary aminolevulinic acid (ALA) and porphobilinogen (PBG) tests would be used to confirm the most likely diagnosis of porphyria.

2. During the physical examination, he suddenly develops a severe headache and mild SOB, and he becomes very anxious. His BP is now 196/122 mmHg. You assess _____; the most appropriate action would be to _____.
- A. hypertension stage I; administer intravenous D5W, then send him home with an appropriate botanical prescription
 - B. hypertension stage II; activate EMS and administer an appropriate homeopathic remedy while you await transport
 - C. hypertensive urgency; administer intravenous D5W, then arrange for his girlfriend to immediately drive him to the ED
 - D. hypertensive emergency; activate EMS for immediate transport to the ED
3. He loses consciousness, but he is breathing and you are able to detect a pulse. Is it appropriate to begin chest compressions, and if so, what would be the correct technique for hand placement?
- A. No.
 - B. Yes; place the heel of one hand over the upper half of his sternum, place the heel of the other hand directly on top, and interlace the fingers of both hands.
 - C. Yes; place the heel of one hand over the lower half of his sternum, place the heel of the other hand directly on top, and interlace the fingers of both hands.
 - D. Yes; place the heel of one hand over the sternum at the xiphoid process, place the heel of other hand directly on top, and interlace the fingers of both hands.
4. After he is stabilized and referred to a specialist, he returns with his girlfriend. She tells you that he has not seemed at all like himself for the past few mornings. He awakens several hours earlier than normal, and seems full of nervous energy. When you interview him, he is easily distracted, and you note that his speech is pressured and he rapidly switches from topic to topic. His mood is elevated until he becomes aware of your concern, at which point he abruptly becomes irritable. Would you diagnose him as having a manic episode according to the DSM-IV, and why or why not?
- A. Yes; his moods are rapidly cycling between periods of elevated mood and depressed mood every few hours.
 - B. No; his symptoms are probably related to his medical condition.
 - C. No; if he was having a manic episode, he would be showing signs of paranoia and inflated self-esteem.
 - D. No; if he was having a manic episode, he would to show signs of disassociation, and he would not be irritated by your concern.
5. One month after you prescribed a well-indicated homeopathic remedy, he returns for a follow-up appointment and says he felt much better within a few days after taking the remedy, but 1 week later he developed a painless urethral discharge that lasted for 3 days. He experienced a similar discharge in his youth. You interpret this to mean that the discharge is _____.
- A. due to suppression
 - B. due to a recent infection
 - C. part of a curative reaction
 - D. not the result of the homeopathic treatment

Example Case #8

PATIENT: 10-year-old female, 60" (152.4 cm) [98th percentile], 93 lbs (42.2 kg) [91st percentile]

PRESENTATION: The patient presents with two pruritic lesions on her right arm. Her mother says she noticed the lesions 1 week ago, and that during this time they have not changed.

MEDICAL HISTORY: The patient's annual well-child appointments to your office have been unremarkable, and she has had all her scheduled vaccinations.

PSYCHOSOCIAL: She lives with her parents and her new kitten. She is in the 5th grade.

HEALTH HABITS: She is a picky eater; she refuses to eat most vegetables, although she loves fruit. She is an active child, and enjoys playing tennis.

SUPPLEMENTS: a children's daily multivitamin supplement

MEDICATIONS: none

ALLERGIES: none known

VITAL SIGNS: Her temperature is 98.4°F (36.9°C), heart rate is 100 bpm, and respiratory rate is 22/min.

PHYSICAL EXAMINATION: She has no lymphadenopathy. You note two reddish annular 2.5 cm plaques on her right upper arm that are not painful to palpation. The advancing borders of the lesions are slightly raised and scaling, and there are a few pinpoint pustules around the edge. There are no other similar lesions. She has a few small excoriations around her wrist. Physical examination is otherwise unremarkable.

PRELIMINARY LAB RESULTS: The results of lab tests are pending.

DIAGNOSTIC IMAGING: Diagnostic imaging studies were not performed at this appointment.

1. The most likely diagnosis is _____, but you must also consider _____ in your differential.
 - A. impetigo; pemphigus and scabies
 - B. impetigo; bedbug bites and varicella
 - C. tinea corporis; impetigo and insect bites
 - D. tinea corporis; pityriasis rosea and varicella
2. To focus your diagnosis, which diagnostic procedure should be performed first?
 - A. IgG testing for viral antibodies
 - B. microscopic examination of skin scraping to detect hyphae
 - C. culture of skin scrapings on blood agar to detect hemolytic colonies
 - D. macroscopic examination of the skin and clothing to look for small insects
3. What needs to be done to prepare a specimen for evaluation?
 - A. Gram stain the collected cells.
 - B. Apply 10% KOH to the skin scraping.
 - C. Grow the collected cells on blood agar.
 - D. Illuminate the lesion and clothing with a Wood's Lamp.

4. Which drug is most indicated for her condition?
 - A. acyclovir
 - B. penicillin
 - C. terbinafine
 - D. doxycycline
5. Which botanical medicine is most indicated to treat her condition?
 - A. oral *Passiflora incarnata*
 - B. oral *Selenicereus grandiflorus*
 - C. topical *Melaleuca alternifolia*
 - D. topical *Podophyllum peltatum*

OR A DIFFERENT FORMAT FOR THIS TYPE OF QUESTION WOULD BE:

6. You consider topical treatment with *Melaleuca alternifolia*, and decide that:
 - A. it would be safe for her, and it is indicated for her condition.
 - B. it would be safe for her, but it is not indicated for her condition.
 - C. it would not be safe for her given her age, although it is indicated for her condition.
 - D. it would not be safe for her, and it would not be indicated for a patient who has this condition.
7. The lesions itch and burn intensely when she is in bed and after she bathes in hot water. She prefers to be barefoot, and she sticks one foot out of the covers at night. Given the information in her case and these additional symptoms, which homeopathic medicine best fits her presentation?
 - A. sulphur
 - B. pulsatilla
 - C. chamomilla
 - D. calcarea carbonica

Example Case #9

PATIENT: 54-year-old female, 5'4" (162.6 cm), 158 lbs (71.7 kg)

PRESENTATION: The patient presents with episodes of heartburn, diaphoresis, and heavy, squeezing chest pain. She becomes extremely fatigued when she experiences these symptoms, but she denies shortness of breath. Her symptoms are worse with exertion and improve with rest. She thinks she may have food poisoning because she ate in a restaurant 2 nights ago, and has not felt well since that time.

MEDICAL HISTORY: At her last appointment 5 years ago, the time was spent addressing menopausal symptoms. At that time, her BP was 142/92 mmHg, and she chose to treat her borderline hypertension with lifestyle modifications. She says that due to her busy schedule, she has not had time to follow up with you.

PSYCHOSOCIAL: She is a landscape architect and says that for the past 5 days, she has been doing relatively strenuous work.

HEALTH HABITS: She eats an omnivorous diet, and emphasizes that the fresh food she buys is usually organically grown. Because her work is physically challenging, she does not follow a regular exercise regimen. She does not drink alcoholic beverages or smoke cigarettes.

SUPPLEMENTS: a daily multivitamin supplement, calcium 1,000 mg qd

MEDICATIONS: none

ALLERGIES: none known

FAMILY HISTORY: Her father died of an MI at age 60, and her mother has hypertension.

VITAL SIGNS: Her temperature is 98.4°F (36.9°C), BP is 162/90 mmHg, heart rate is 90 bpm, and respiratory rate is 16/min.

PHYSICAL EXAMINATION: Her skin is cool and clammy. Neurological examination is unremarkable. There is no evidence of peripheral edema. Her lungs are clear. On cardiac auscultation, soft S4 is heard over the apex, and a new II/VI systolic murmur is heard.

PRELIMINARY LAB RESULTS:

TEST	U.S. VALUE	U.S. RANGE	IU VALUE	IU RANGE
cholesterol	250 mg/dL	< 200 mg/dL	6.0 mmol/L	< 5.2 mmol/L
LDL	165 mg/dL	< 100 mg/dL	4.1 mmol/L	< 2.6 mmol/L
HDL	30 mg/dL	> 40 mg/dL	0.85 mmol/L	> 1.3 mmol/L

DIAGNOSTIC IMAGING:

Diagnostic imaging studies were not performed at this appointment.

1. The most likely diagnosis is _____ but you must also consider _____ in your differential.
 - A. pleurisy; costochondritis and GERD
 - B. pleurisy; esophageal motility disorder and costochondritis
 - C. acute coronary syndrome; GERD and costochondritis
 - D. acute coronary syndrome; esophageal motility disorder and pleurisy
2. Your first step would be to order a(n) _____ to assess for _____.
 - A. echocardiogram; pleurisy
 - B. CPK with MB bands; pleurisy
 - C. ECG; acute coronary syndrome
 - D. chest radiograph; acute coronary syndrome

OR, A DIFFERENT FORMAT TO TEST THIS COMPETENCY WOULD BE:

3. If an ECG showed _____, it would indicate _____.
 - A. premature beats; myocardial ischemia
 - B. wide QRS complex; a 2nd degree block
 - C. prolonged PR interval; a 3rd degree block
 - D. elevated ST segments; myocardial ischemia

4. Which drug is most indicated for her condition?
 - A. aspirin
 - B. atropine
 - C. acetaminophen
 - D. hydrochlorothiazide

5. Sometimes she is awakened at 1:00 a.m. by the pain, which is relieved if she sips a hot beverage. Given the information in her case and these additional symptoms, which homeopathic medicine best fits her presentation?
 - A. phosphorus
 - B. arnica montana
 - C. arsenicum album
 - D. aconitum napellus

Example Case #10

PATIENT: 28-year-old female; 5'5" (165 cm), 120 lbs (54.4 kg)

PRESENTATION: The patient presents for her third appointment to receive general wellness counseling. As in previous visits, she is dressed in a tight-fitting, leopard-skin outfit, with exposed cleavage and midriff. Her makeup and hairstyle are theatrical, her gestures are exaggerated, she is flirtatious, and she frequently touches you as she speaks. She effusively praises you, and alternately laughs and cries as she discusses her feelings toward you. She describes her numerous previous doctors as "inept fools".

MEDICAL HISTORY: G5P0, TAB 5; her first pregnancy occurred at age 13. She has a history of cocaine abuse, which also began at that age. Her past medical records include notations of provocative clothing and inappropriate and flirtatious behavior toward the medical staff. She participated in group therapy for her cocaine addiction, and was noted to be loud, disruptive, and demanding to be the center of attention.

PSYCHOSOCIAL: She is unemployed and changes jobs often. She cries as she tells you that women eventually become jealous of her and betray her friendship. She dropped out of secondary school in her sophomore year, as she felt that she was more mature than the other students and they were envious of her. She says she had many "best friends" in secondary school, but the relationships eventually disappointed her because the girls did not care enough about her.

HEALTH HABITS: She eats a whole foods diet, and works out at a gym 2 or 3 times per month. She has not used cocaine for 2 years, and she frequently uses detoxification and liver cleanse products.

SUPPLEMENTS: She is currently on a self-prescribed detoxification protocol that includes a laxative, probiotics, multivitamin, protein drink, EFAs, and a liver support formula.

MEDICATIONS: none

ALLERGIES: none known

FAMILY HISTORY: unremarkable

VITAL SIGNS: Her temperature is 98.6°F (37°C), BP is 124/76 mmHg, heart rate is 68 bpm, and respiratory rate is 14/min.

PHYSICAL EXAMINATION: Her neck is supple, there is no lymphadenopathy, and her thyroid is of normal size and contour. Tympanic membranes and external auditory canals are clear. On cardiac auscultation, you hear a regular rate and rhythm, with no rubs, gallops, or murmurs. Bowel sounds are heard in all quadrants, and abdominal examination is unremarkable.

PRELIMINARY LAB RESULTS:

CBC, metabolic panel, lipid panel, and thyroid function tests are all WNL.

DIAGNOSTIC IMAGING:

Diagnostic imaging studies were not performed at this appointment.

1. Her _____ would be most suggestive of a _____ personality disorder.
 - A. identity disturbance; narcissistic
 - B. highly suggestible nature; narcissistic
 - C. inappropriate seductive behavior; histrionic
 - D. frantic efforts to avoid abandonment; histrionic

2. What would be the most appropriate initial approach to treat her condition?
 - A. referral to a psychiatrist for a prescription of trazodone
 - B. referral to a psychiatrist for a prescription of fluoxetine
 - C. referral to a psychiatrist for a prescription of alprazolam
 - D. None of the above; counseling would be the most appropriate treatment.

3. You prescribe a nervine tonic that contains *Scutellaria lateriflora*, *Passiflora incarnata*, *Melissa officinalis*, and *Verbena officinalis* (1:1:1:1), to be taken 1 tsp tid. At a 2-week follow-up appointment, she says she has been feeling great, has been sleeping well, and has a couple of job interviews scheduled. The main problem now is that she is very fatigued in the afternoon. What is the most appropriate course of action?
 - A. Add *Panax ginseng* to the formula.
 - B. Recommend that she only take the formula hs.
 - C. Recommend that she continue taking the same formula, but decrease the dose to ½ tsp tid.
 - D. Recommend that she continue taking the same formula and dosage until her next 2-week follow-up appointment.

4. Two weeks later, she calls in tears to tell you that she discovered she was not hired for a job that she had very much wanted. She is sure it was because the interviewer was intimidated by her intelligence. She says she has had "enough", and tells you that she intends to kill herself by taking all the herbs and supplements in her medicine chest. What is the most appropriate course of action?
 - A. Realize that this is a manipulative and unrealistic plea for attention. Reassure her that you hear her distress, and encourage her to use some stress management tools.
 - B. Reassure her that you hear her distress, and that her safety is of the utmost importance to you. Make her commit to come in for a follow-up appointment as soon as possible.
 - C. Inform her that her safety is of the utmost importance to you. Let her know you believe she would be best served by receiving immediate emergency attention, and that you will call the local crisis intervention team.
 - D. None of the above; you do not take this suicide plan seriously, as no real harm can come from taking the herbs and supplements that she has in her home.

5. You recommend that she _____, because research has shown that this lifestyle change can reduce anxiety, cause the release of endogenous opioids, and enhance immune function.
 - A. eat a raw-foods diet
 - B. sleep 9 to 10 hours per night
 - C. begin an aerobic exercise regimen
 - D. begin systematic desensitization therapy

Example Case #11

PATIENT: 8-year-old male

PRESENTATION: The anxious mother of the patient calls you at 11:30 p.m. because the child has developed a loud barking cough and is struggling to breathe. You can hear the child coughing in the background. Onset of the cough was several hours ago, after he played outside in the cold wind. The mother noticed that he was pale and had a runny nose the day before.

MEDICAL HISTORY: At his well-child checkup 1 month ago, you examined the child and found him to be a healthy child with normal development.

ALLERGIES: none known

VITAL SIGNS: The mother says that his temperature is 101.5°F (38.6°C), heart rate is 120 bpm, and respiratory rate is 60/min.

1. What is the most important question to ask the mother?
 - A. "Has he been vomiting?"
 - B. "Is he holding his neck rigid?"
 - C. "Is there a rash on his abdomen?"
 - D. "What is his breathing like between coughing spells?"
2. The most likely diagnosis is _____, you must also consider _____ in your differential.
 - A. pertussis; bronchitis and epiglottitis
 - B. pertussis; epiglottitis and foreign object in the airway
 - C. laryngotracheobronchitis; bronchitis and pneumonia
 - D. laryngotracheobronchitis; pertussis and foreign object in the airway
3. His mother tells you that while the child was playing outside, he was nearly hit by a car. He became extremely distraught and frightened, and his symptoms started soon after this event. She says that he has always had a fear of dying. Given the information in his case and these additional symptoms, which homeopathic medicine best fits his presentation?
 - A. drosera
 - B. belladonna
 - C. aconitum napellus
 - D. eupatorium perfoliatum
4. Which home treatment would offer the most immediate relief?
 - A. steam inhalation
 - B. a nutritive enema
 - C. effleurage over the rib area
 - D. wrapping the child in hot blankets

5. The child is brought to your office the next day. While you are drawing a blood sample for a CBC, a phlebotomy tube filled with blood falls onto the floor and breaks. As part of the hazardous materials management plan in your office, it is most important to:
- A. wipe the area of the spill with alcohol.
 - B. have office staff tested for possible exposure to blood-borne pathogens.
 - C. immediately remove the broken tubing and place it in a sharps container.
 - D. provide the staff who clean up the spill with personal protective equipment.

Example Research Item (a stand-alone item unrelated to the previous cases)

You were taught in several courses that *Hydrangea arborescens* is effective in treating urolithiases. Your experience in the clinic has borne this out. The latest issue of the *New Zealand Journal of Botanical Medicine* reports a randomized, controlled clinical trial on the effect of *H. arborescens* in the treatment of urolithiases. Results are reported with a $p=0.06$. What does this mean, and how should you use the information?

- A. *H. arborescens* will be effective in 94% of patients who have urolithiases. Continue to use the botanical as before.
- B. Research results are significant if $p=0.05$; the additional 0.01 in this study can undoubtedly be accounted for by some methodological flaw in the study. Continue to use the botanical as before.
- C. Because this study was reported in a prestigious journal, you can assume that *H. arborescens* is not effective in the treatment of urolithiases. Discontinue its use for treatment of urolithiases.
- D. The failure of the results to reach statistical significance despite your experience with *H. arborescens* may indicate that the study failed to control for some important factor. Wait for more research results before you stop using the botanical for the treatment of urolithiases.

Answers to Core Clinical Case Cluster Example Items

Case #1: 1. C 2. D 3. C 4. C 5. D
Case #2: 1. A 2. B 3. D 4. C 5. D 6. A 7. B 8. B
Case #3: 1. A 2. C 3. A 4. C 5. C 6. C 7. D
Case #4: 1. C 2. D 3. C 4. A 5. A 6. A 7. B
Case #5: 1. B 2. D 3. D 4. C 5. B 6. C 7. C 8. A
Case #6: 1. C 2. D 3. A 4. D 5. A 6. D
Case #7: 1. C 2. D 3. A 4. B 5. C
Case #8: 1. C 2. B 3. B 4. C 5. C 6. A 7. A
Case #9: 1. C 2. C 3. D 4. A 5. C
Case #10: 1. C 2. D 3. C 4. C 5. C
Case #11: 1. D 2. D 3. C 4. A 5. D
Research Item: D

NPLEX PART II - CORE CLINICAL SCIENCE EXAMINATION PASSING STANDARDS AND EXAM RESULTS

The NPLEX Part II - Core Clinical Science Examination is a single, integrated examination that tests your knowledge of diagnosis, Materia Medica, other treatment modalities, and medical interventions. To pass the examination, you must be able to demonstrate concurrent² competence in four *general* exam areas³: *Diagnosis*, *Materia Medica*, *Other Modalities*, and *Medical Interventions*.

The report of your Part II - Core Clinical Science Examination results will provide information regarding your overall passing status and will include a visual scale that illustrates your performance in each of the four *general* exam areas relative to the minimum percentage of items you must correctly answer to pass that *general* exam area.

Comprehensive Mastery indicates, with either a “P” (pass) or “F” (fail) designation, whether or not you have passed the NPLEX Part II - Core Clinical Science Examination.

You have passed the NPLEX Part II - Core Clinical Science Examination when you have achieved a “P” (pass) in all four *general* exam areas (as indicated by the competencies listed on pages 5 to 8):

Diagnosis, which reflects the result you achieved on the exam items that relate to physical and clinical diagnostic methods, and lab tests and imaging studies

Materia Medica, which reflects the result you achieved on the exam items that relate to botanical medicine and homeopathy

Other Modalities, which reflects the result you achieved on the exam items that relate to nutrition, physical medicine, and psychology

Medical Interventions, which reflects the result you achieved on the exam items that relate to emergency medicine and pharmacology

² That is, passing two general exam areas in one exam administration and the other two on another exam administration does not constitute a passing result. You must pass all four general exam areas on the same exam administration.

³ You have passed the Part II - Core Clinical Science Examination when you have correctly answered at least the number of questions that NPLEX subject matter experts (licensed/registered NDs) have determined are required to demonstrate competence in each of the four *general* exam areas. (NPLEX uses a modified Angoff method.)

NPLEX PART II - CLINICAL ELECTIVE EXAMINATIONS

The four examinations described on the following pages are elective examinations, meaning that they are not required by all jurisdictions. Check the NABNE website or the most up-to-date copy of the *NABNE Part II Examinee Handbook* to determine if the jurisdiction in which you plan to practice requires passage of any of these examinations.

The Elective Pharmacology Examination (EPE) is intended for NDs who will be practicing in jurisdictions that grant prescriptive authority to NDs. At this time it is required by only four jurisdictions. Although there is some overlap between the CCSE and the EPE drug lists, the list of drugs that could be tested in the 40 pharmacology items on the CCSE is different from the list of drugs that could be tested on the 75-item EPE.

Consider taking the EPE when you take the CCSE if you are going to be practicing in an unregulated jurisdiction or in a regulated jurisdiction that does not currently grant prescribing rights. Studying drugs on both the CCSE drug list and the EPE drug list at the same time will increase your ability to pass both examinations. If the jurisdiction in which you are practicing passes legislation granting prescribing rights to NDs (with subsequent requirement of the EPE), you may not need to study for an examination again. As an additional consideration, if you pass the EPE when you pass the CCSE, you will not need to pay the elective exam application and proctoring fee (\$150) an additional time.

If you are planning to practice in a jurisdiction that currently grants prescribing rights but does not require passage of the EPE, you will still want to make sure you are familiar with the drugs on the EPE list. These drugs were identified in a survey of practicing NDs as being the most frequently encountered in practice, and you will need to know about these drugs to be a safe practitioner.

The new Parenteral Medicine Elective Examination (PMEE) is not currently required by any jurisdiction, but several have indicated an intention to do so. If you want to be able to provide parenteral services to your patients, you might consider taking the PMEE to test your knowledge of the practice.

NPLEX PART II - CLINICAL ELECTIVE EXAMINATION IN-OFFICE MINOR SURGERY COMPETENCIES, CONDITIONS, AND BLUEPRINT WEIGHTINGS (75 items)

A minimally competent entry-level naturopathic physician who will be using in-office minor surgical procedures as part of a naturopathic practice should be able to demonstrate knowledge in the following competencies:

A. DIAGNOSIS: Assess and diagnose common conditions (see list on page 53) that can be treated in-office with minor surgical procedures; when appropriate, make referrals for procedures that are beyond the naturopathic scope of practice:

1. Take a medical and psychosocial history, and interpret findings.
2. Perform a physical examination and interpret findings.
3. Recognize the signs and symptoms of the condition, and characteristics of a typical lesion.
4. Make a diagnosis and generate a differential diagnosis.
5. Delineate the pathogenesis of conditions, and determine possible etiologies.
6. Collect and prepare specimens for lab evaluation, select necessary lab tests, and interpret results.
7. Identify relevant risk factors.
8. Determine the prognosis and potential sequelae.
9. Identify high risk patients, and know when referral is necessary.

B. TREATMENT SELECTION: Treat common conditions using the most appropriate therapeutic interventions:

1. Identify the indications for and contraindications to biopsy of superficial skin lesions.
2. Identify the indications for and contraindications to excision and removal of superficial skin lesions.
3. Identify the indications for and contraindications to incision and drainage of superficial skin lesions.
4. Identify the indications for and contraindications to cryosurgery of superficial skin lesions.
5. Identify the indications for and contraindications to chemical cautery or electrocautery of superficial skin lesions.
6. Identify the indications for and contraindications to electrodesiccation (with or without curettage) of superficial skin lesions.
7. Identify the indications for and contraindications to lift-and-snip of superficial skin lesions.
8. Identify the indications for and contraindications to nail trephination, removal, and ablation.
9. Identify treatment options for traumatic wound care and laceration repair.
10. Know topical, injectable, or oral treatments for skin conditions.
11. Know other treatment options for skin lesions that would be performed upon referral to specialty practitioners.
12. Ensure patient safety by identifying patient characteristics that would influence selection of treatment and procedures.

C. PROCEDURES Apply principles of minor surgical in-office procedures.

1. Identify common infectious agents, understand the infective process, and treat infections that result from breach of the dermal barrier.
2. Apply the principles of pre-operative procedures and site preparation (including pre-operative instructions to patients).
3. Apply the principles of anesthesia selection and administration, including different types of injectable, topical, and cryo anesthetics.
4. Select the most appropriate instruments and materials required for minor surgical procedures.
5. Know how to correctly perform: biopsy; excision and removal; incision and drainage; cryosurgery; chemical cautery or electrocautery; electrodesiccation with or without curettage; nail trephination, removal, and ablation; and laceration repair.
6. Apply principles of hemostasis, including patient positioning, choice of anesthesia, topical hemostatic agents, and electrocautery.
7. Apply the principles of wound care, including irrigation and debridement.
8. Apply the principles of wound closure, including selection of sutures, tissue adhesives, staples, tapes, and appropriate application techniques.
9. Manage complications that arise during surgical procedures.
10. Employ precautionary methods to protect the practitioner from infection and injury.

D. POSTOPERATIVE CARE: Manage postoperative patient care.

1. Provide appropriate postoperative instructions to patients.
2. Communicate appropriate postoperative care procedures.
3. Apply the principles of postoperative pain management.
4. Identify and treat postoperative complications.
5. Provide appropriate monitoring and followup.

Conditions

1. **Pustular Lesions (14%)**
abscess, carbuncle, furuncle
2. **Cystic Formations (14%)**
cysts (dermoid, epidermoid, sebaceous, ganglion, trichilemmal), milia
3. **Skin Lesions (33%)**
acrochordon, actinic keratosis, cherry hemangioma, cutaneous horn, keratoacanthoma, lentigine, molluscum contagiosum, nevus, pyogenic granuloma, sebaceous hyperplasia, seborrheic keratosis, telangiectasia, verruca
4. **Nail Conditions (14%)**
felon, ingrown nail, paronychia, subungual hematoma
5. **Anal and Genital Conditions (5%)**
anal fistula, condylomata acuminata, pilonidal cyst
6. **Masses and Neoplasms (14%)**
basal cell carcinoma, dermatofibroma, lipoma, melanoma, squamous cell carcinoma
7. **Traumatic Injuries (6%)**
bites, foreign bodies, lacerations

Example Case #1

A 25-year-old female presents with a painful swelling in her left axilla that first began as a pimple 4 days ago. She has no prior history of these symptoms and no known allergies to drugs or medications. Her vital signs are all within normal limits. Physical examination reveals a single, erythematous, edematous 3.0 cm lesion in her recently shaved left axilla that is exquisitely painful to palpation.

1. Based on this presentation, you would diagnose _____ if physical examination revealed _____.
 - A. abscess; a soft fluctuant mass
 - B. abscess; an indurated nodular mass
 - C. sebaceous cyst; a palpable fixed mass
 - D. sebaceous cyst; a discreet palpable nodule
2. Which procedure would be most appropriate to treat her lesion, and what would be the best technique for administering anesthesia?
 - A. incision and drainage; field block
 - B. excision and removal; nerve block
 - C. incision and drainage; a topical anesthetic
 - D. excision and removal; direct injection into the lesion
3. To perform the surgical procedure on her lesion, which instruments should you choose for your surgical pack?
 - A. a #11 scalpel and forceps
 - B. a #11 scalpel and hemostat
 - C. a #15 scalpel and hemostat
 - D. a #15 scalpel and iris scissors
4. After the procedure, the physician should:
 - A. close the wound with steri-strips.
 - B. pack the site with iodoform gauze.
 - C. close the wound with cutaneous removable sutures.
 - D. close the wound with subcutaneous absorbable sutures.
5. She returns 1 week post-op with a purulent drainage from the operative site. What is the most likely reason?
 - A. There was trauma to the wound site.
 - B. The drainage is part of the normal healing response.
 - C. The surgical wound became infected from an exogenous source.
 - D. The original lesion was multilocular and was not drained completely.

Example Case #2

A 37-year-old male presents with a bump behind his right ear. He says the bump has been present for at least 1 year, but has become larger in the past month. He wants it removed for cosmetic reasons. He has no known drug allergies. Physical examination reveals a single, round, 2.0 cm mass that is nontender to palpation.

1. You would diagnose _____ if the mass was _____.
 - A. sebaceous cyst; fluctuant
 - B. nevus; indurated and fixed
 - C. nevus; indurated and mobile
 - D. sebaceous cyst; soft and mobile
2. The most appropriate treatment of this his mass would be _____.
 - A. lift and snip
 - B. excision and biopsy
 - C. incision and drainage
 - D. incision and removal of the entire mass
3. If anesthesia were indicated, which anesthetic would be most appropriate to administer?
 - A. 1% lidocaine with epinephrine
 - B. 2% procaine without epinephrine
 - C. 0.5% bupivacaine with epinephrine
 - D. topical application of EMLA cream
4. What is the most effective method to prevent recurrence of the mass?
 - A. remove the entire capsule
 - B. pack the cavity with iodoform gauze
 - C. allow the wound to heal without suturing
 - D. make the incision along skin-tension lines
5. If the surgical procedure required suturing, and he has no post-operative complications, when should the sutures be removed?
 - A. in 3 to 4 days
 - B. in 4 to 6 days
 - C. in 7 to 9 days
 - D. in 12 to 14 days

Example Case #3

A 41-year-old 8-week pregnant female presents with a brown lesion located at her bra line. Over the past few months it has become larger, raised, and occasionally painful. She wants to have it removed. She is allergic to penicillins and sulfonamides. Physical examination reveals a single, brownish-black, round, 3 mm papule that has a notable margin of erythema.

1. You would suspect that the lesion is benign if it _____.
 - A. is friable
 - B. has regular borders
 - C. has mottled coloring
 - D. has irregular borders
2. Which technique will most appropriately remove the lesion for biopsy?
 - A. cryosurgery
 - B. shave biopsy
 - C. electrodesiccation
 - D. chemical cauterization
3. Which anesthetic is generally safe during the first trimester of pregnancy??
 - A. lidocaine
 - B. epinephrine
 - C. bupivacaine
 - D. mepivacaine

Answers to Minor Surgery Example Items

Case #1: 1. A 2. A 3. B 4. B 5. D
Case #2: 1. D 2. D 3. A 4. A 5. C
Case #3: 1. B 2. B 3. A

**NPLEX PART II - CLINICAL ELECTIVE EXAMINATION
ELECTIVE PHARMACOLOGY (EPE) COMPETENCIES,
BLUEPRINT WEIGHTINGS, AND EPE DRUGS (75 items)**

A minimally competent entry-level naturopathic physician who will be prescribing drugs as part of a naturopathic practice should be able to demonstrate knowledge in the following competencies:

A. PRINCIPLES: Understand the principles of pharmaceutical prescribing.

1. Know indications for prescription of drugs.
2. Understand the mechanisms of action of drug classes and of specific drugs.
3. Know the principles of pharmacodynamics and pharmacokinetics.

B. PATIENT SAFETY: Evaluate drug prescriptions for patient safety.

1. Know contraindications for drugs.
2. Know common and/or critical adverse effects of drugs.
3. Identify factors that affect drug toxicity.
4. Know potential drug-drug interactions (including the OTC drugs on the list at the end of the drug list).
5. Be able to perform physical assessments and/or know appropriate lab tests to monitor drug efficacy and assess drug toxicity.

C. PRESCRIBING: Provide appropriate and effective patient care.

1. Diagnose conditions and select drug prescriptions to address those conditions.
2. Instruct patients on appropriate use and administration of prescription drugs.
3. Know appropriate dosing procedures (e.g., indicated routes of administration, principles of titrating and tapering, adjusting dosages in response to monitoring results, etc.).
4. Know multidrug protocols for common conditions (e.g., diabetes, CAD, etc.).
5. Identify and manage polypharmacy issues.
6. Identify and manage opportunities for deprescribing.
7. Recognize characteristics of drug-seeking behavior.
8. Demonstrate knowledge of the abuse potential of prescription and street drugs: identify commonly abused drugs, know their mechanisms of action and dangerous adverse effects, and demonstrate ability to safely and effectively utilize prescription pain medications.
9. Identify conditions and treatments most appropriately managed by referral to a specialist.

ELECTIVE PHARMACOLOGY DRUG CATEGORIES & WEIGHTINGS

- 1. Drugs acting on the cardiovascular system (8%-10%)**
- 2. Drugs acting on the endocrine system (8%-10%)**
- 3. Drugs acting on the blood and lymph system (3%-4%)**
- 4. Drugs acting on the dermatologic system (3%-4%)**
- 5. Drugs used to treat disorders of the eye, ear, and nose (2%-3%)**
- 6. Drugs acting on the gastrointestinal/hepatic system (6%-8%)**
- 7. Drugs acting on the genitourinary system (4%-6%)**
- 8. Drugs acting on the musculoskeletal system (3%-4%)**
- 9. Drugs acting on the nervous system (7%-9%)**
- 10. Drugs acting on the respiratory system (4%-5%)**
- 11. Drugs used to treat psychological and cognitive disorders (7%-9%)**
- 12. Drugs used for pain management, drug addiction, and drug overdose (7%-9%)**
- 13. Drugs used as antimicrobials, and vaccines (10%-12%)**
- 14. Drugs used for chemotherapy and immunosuppression (8%-9%)**
- 15. Pharmacodynamics and Pharmacokinetics (7%-8%)**

Drugs on the Elective Pharmacology Examination

[NOTE: Because brand names in Canada and the United States are frequently different, only generic names will be used on both this blueprint and the examination. Some generic names are also different, and these will be noted as U.S. name/Canadian name.]

5-fluorouracil	canagliflozin
acetylcysteine	Cannabis
acyclovir	carvedilol
adalimumab	cefdinir
albendazole	ceftriaxone
albuterol (salbutamol)-inhaled	cefuroxime
alendronate	celecoxib
allopurinol	cephalexin
alprazolam	cholera vaccine
alprostadil	ciprofloxacin
amantadine	cisplatin
amiodarone	clarithromycin
amitriptyline	clindamycin
amlodipine	clobetasol propionate
amoxicillin	clomiphene
amoxicillin/clavulanate	clonidine
ampicillin	clopidogrel
anastrozole	clozapine
aripiprazole	cocaine
atenolol	codeine
atomoxetine	colchicine
atorvastatin	colesevelam
azithromycin	cromolyn sodium-nebulized
baclofen	cyclobenzaprine
beclomethasone	cyclophosphamide
benzonatate	cyclosporine
benztropine	cyclosporine-ophthalmic
bethanechol	dabigatran
bicalutamide	denosumab
botulinum toxin	desmopressin
bromocriptine	dexamethasone
budesonide-oral	dextroamphetamine
bupivacaine	DHEA
buprenorphine	diazepam
bupropion	diclofenac-gel
buspirone	digoxin
calcipotriol (calcipotriene)	diltiazem
calcitonin	diphenoxylate/atropine

donepezil
doxazosin
doxorubicin
doxycycline
drospirenone/ethinyl estradiol
duloxetine
enoxaparin
entecavir
epinephrine (adrenaline)
epoetin alfa
erythromycin
escitalopram
esomeprazole
estradiol
estriol
eszopiclone
etanercept
ezetimibe
fentanyl
finasteride
fingolimod
flecainide
fluconazole
fludrocortisone
fluocinonide
fluoxetine
fluticasone
furosemide
gabapentin
gemfibrozil
gentamicin drops
glatiramer acetate
glucagon
glyburide
Haemophilus influenzae (Hib) vaccine
haloperidol
heroin
heparin
HAV vaccine
HBV vaccine
HPV quad vaccine
human chorionic gonadotropin
hydralazine
hydrochlorothiazide

hydrocodone
hydrocortisone
hydroxychloroquine
hydroxyzine
hyoscyamine
imiquimod
indomethacin
infliximab
influenza vaccine
insulin glargine
insulin lispro
insulin regular
interferon alfa
interferon beta
ipratropium bromide
irbesartan
isoniazid
isosorbide mononitrate
isotretinoin
ivermectin
ketamine
ketoconazole
ketorolac
lamotrigine
latanoprost
leuprolide
levodopa/carbidopa
levofloxacin
levonorgestrel
levothyroxine
lidocaine
liothyronine
liraglutide
lisinopril
lithium
losartan
meclizine-OTC
medroxyprogesterone acetate
megestrol acetate
meloxicam
memantine
meningococcal conjugate vaccine
mesalazine (mesalamine)
metformin

methadone	potassium chloride
methimazole	pramipexole
methocarbamol	prednisolone
methotrexate	prednisone
methylphenidate	pregabalin
methylprednisolone	pregnenolone
metoclopramide	procaine
metoprolol	progesterone-oral micronized
metronidazole	promethazine
minocycline	propranolol
mirtazapine	propylthiouracil
measles, mumps, rubella vaccine (MMR)	quetiapine
modafinil	raloxifene
montelukast	ramipril
morphine	rifampin (rifampicin)
mupirocin	rifaximin
naloxone	rivaroxaban
naltrexone	rivastigmine
neomycin/polymyxin B/hydrocortisone	salmeterol
nepafenac	scopolamine
nicotine-patch	selenium disulfide
nitrofurantoin	sildenafil
nitroglycerin	simvastatin
norelgestromin/ethinyl estradiol-patch	sitagliptin
norethindrone	solifenacin
octreotide	somatropin
olopatadine-ophthalmic	spironolactone
ondansetron	sulfacetamide
oseltamivir	sulfasalazine
oxybutynin	sumatriptan
oxycodone	tacrolimus
paclitaxel	tamoxifen
pantoprazole	tamsulosin
paroxetine	Tdap and DTaP vaccine
penicillin VK	terazosin
pentoxifylline	terbinafine
permethrin	testosterone
phenelzine	thalidomide
phenytoin	thyroid, USP
pilocarpine	timolol
pioglitazone	tiotropium
pneumococcal polysaccharide (polyvalent) vaccine	tizanidine
polio vaccine, inactivated (IPV)	tofacitinib
	tolterodine

topiramate	vancomycin
tramadol	varenicline
trastuzumab	varicella vaccine and zoster vaccine
trazodone	venlafaxine
tretinoin (topical)	verapamil
triamcinolone	warfarin
triamterene	zidovudine (azidothymidine)
trimethoprim/sulfamethoxazole	zolpidem
ursodeoxycholic acid (ursodiol)	zoster vaccine recombinant, adjuvanted
valacyclovir	
valproate (divalproex)	

Over-the-Counter (OTC) Drugs

The following OTC drugs may appear on the examination to test knowledge of potential interactions of these common drugs with the prescription drugs on the list. For example, the prescription you select might be different if a patient is taking an H2 receptor antagonist.

aspirin
acetaminophen
cetirizine
cimetidine
diphenhydramine
fexofenadine
guaifenesin
ibuprofen
lansoprazole
loperamide
naproxen sodium
omeprazole
oral osmotics
vitamin K1

Unlike other NPLEX examinations, the items on the Elective Pharmacology Examination will be “stand-alone” items.

Example Item #1

A 57-year-old male presents with chronic prostatitis. He has a history of claudication for which he is currently taking pentoxifylline. Is it appropriate to prescribe ciprofloxacin for his prostatitis, and if not, why not?

- A. No, the two drugs should not be taken concomitantly, as pentoxifylline increases the toxicity of ciprofloxacin.
- B. No, ciprofloxacin would not effectively treat this infection, although it would enhance the efficacy of the pentoxifylline.
- C. No, the two drugs should not be taken concomitantly, as pentoxifylline decreases ciprofloxacin levels by speeding drug metabolism.
- D. Yes, but you should decrease his pentoxifylline dosage, because ciprofloxacin increases pentoxifylline levels by slowing drug metabolism.

Example Item #2

A 63-year-old male experienced multiple seizures and was diagnosed with epilepsy. His medical history includes a sinoatrial (SA) block and compromised kidney function. Which drug is **CONTRAINDICATED** for his seizures, and why?

- A. valproate; it could exacerbate the SA block
- B. phenytoin; it could exacerbate the SA block
- C. valproate; it could further impair his kidney function
- D. phenytoin; it could further impair his kidney function

Example Item #3

A 19-year-old female is diagnosed with depression and bulimia nervosa. What is the most appropriate first-line drug treatment for her?

- A. fluoxetine
- B. bupropion
- C. mirtazapine
- D. ondansetron

Example Item #4

Drug X has a half-life of 3 hours. If the initial plasma level after a single dose of the drug is 3600 mg/L, what will its plasma level be after 9 hours?

- A. 450 mg/L
- B. 600 mg/L
- C. 900 mg/L
- D. 1800 mg/L

Answers to Elective Pharmacology Example Items

Item #1: D

Item #2: B

Item #3: A

Item #4: A

NPLEX PART II - CLINICAL ELECTIVE EXAMINATION ACUPUNCTURE COMPETENCIES, SYNDROMES, AND BLUEPRINT WEIGHTINGS (75 items)

Conventions in terminology used in the NPLEX Acupuncture examination are from the publication *A Proposed Standard International Acupuncture Nomenclature*, World Health Organization, Geneva, 1991.

BL = Bladder	KI = Kidney	SI = Small Intestine
CV = Conception Vessel	LI = Large Intestine	SP = Spleen
GB = Gall Bladder	LR = Liver	ST = Stomach
GV = Governing Vessel	LU = Lung	TE = Triple Energizer/Triple Burner/Triple Warmer
HT = Heart	PC = Pericardium	

A minimally competent entry-level naturopathic physician who will be using acupuncture as part of a naturopathic practice should be able to demonstrate knowledge in the following competencies:

I. DIAGNOSIS: Diagnose Zang-Fu syndromes (see Syndromes list, page 68) through the means of:

A. Physical Examination

1. Palpation of pulse characteristics (positions, quality at each position, and the significance of the findings)
2. Observation of tongue characteristics (body color, shape, coating, moisture and the significance of the findings)
3. Observation of the patient's appearance, vitality, and other indicators of constitution.

B. Interrogation using the Ten Questions regarding:

1. Temperature (hot/cold, fever/chills)
2. Sweating (quantity/quality/time of day/location on body)
3. Head and face (quality of head pain, dizziness, location of symptoms, eye symptoms, ear symptoms)
4. Pain (severity, quality, location on body, chronicity or acuteness, time of day, aggravating factors, ameliorating factors, distension)
5. Urine and stool (incontinence, retention, incomplete urination or evacuation, color & quality, consistency, amount, size, frequency, chronicity, urgency, timing, discomfort or relief)
6. Digestion
 - a. Thirst (intensity of thirst, dryness of mouth)
 - b. Appetite (intensity of appetite, distension after eating, preferences and cravings)
 - c. Tastes (bitter/sweet/sour/salty/pungent/metallic/absent)
7. Sleep (characteristics of insomnia, quality of sleep, nightmares)
8. Thorax and abdomen (pain by location, quality of pain)
9. Gynecological issues (quality of menses, timing of menses, characteristics of blood)
10. Medical history, lifestyle, and habits (major illnesses and procedures, family history and genetic illnesses, prescription and recreational drug use, emotional states, and other predisposing factors)

C. Identification of the pattern of Zang-Fu disharmony according to:

1. Eight principles (Interior/Exterior, Hot/Cold, Deficiency/Excess, Yin/Yang)
2. Vital substances (Qi, Blood, Body Fluid, Jing/Essence, Shen/Mind)
3. Five elements (Earth, Fire, Metal, Water, Wood)
4. Channels/meridians (Lung, Large Intestine, Stomach, Spleen, Heart, Small Intestine, Bladder, Kidney, Pericardium, Triple Energizer, Gall Bladder, Liver, Conception Vessel, and Governing Vessel)
5. Organ Functions
 - a. Zang/Yin (Solid) Organs (Heart, Liver, Lungs, Spleen, Kidney, Pericardium)
 - b. Fu/Yang (Hollow) Organs (Stomach, Small Intestine, Large Intestine, Gall Bladder, Triple Energizer)

II. TREATMENT: Treat patients by applying principles of acupuncture.

A. Understand treatment principles, and select treatments that address Zang-Fu syndromes.

B. Identify the function, apply the principles of point combining, and know which point protocols are indicated for the following acupuncture points:

1. LU 1,5,7,9,10,11
2. LI 1,4,10,11,15,20
3. ST 1,7,17,25,30,36,37,38,40,42,44,45
4. SP 1,3,4,6,9,10,15,21
5. HT 1,3,5,7,8,9
6. SI 1,3,8,9,10,11,12,13,19
7. BL 1,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,40,44,52,57,60,62,67
8. KI 1,3,6,7,10,16,27
9. PC 1,3,6,7,9
10. TE 1,4,5,6,10,14,17,21,23
11. GB 1,2,12,14,20,21,24,25,30,34,39,40,41,44
12. LR 1,2,3,5,8,13,14
13. CV 1,2,3,4,6,8,12,13,14,17,22,24
14. GV 1,2,4,9,14,20,24,28
15. Extra points
 - a. Head and neck: Shi Shen Cong, Yin Tang, Tai Yang, Bi Tong/ ShangYing Xiang, Anmian, Ding Chuan, Jia Ji/Hua Tuo Jia Ji
 - b. Abdomen, chest, and back: Zi Gong
 - c. Arm and hand: Shi Xuan, Ba Xie, Jiaguan/Jianneling, Yaotongxue
 - d. Leg and foot: Baichongwo, He Ding, Xi Yan, Dan Nang Xue, Lan Wei Xue, Ba Feng

C. Identify when it is appropriate to use a different (non-acupuncture) treatment modality; know indications and contraindications for, and use of moxibustion, cupping, gua sha, and electricity.

D. Refer patients to other practitioners when appropriate.

III. TECHNIQUE: Ensure treatment effectiveness by using correct technique.

A. Needling

1. Know location of points.
2. Employ correct insertion angles, depths, and techniques.

B. Moxibustion

1. Know which points are safe for moxibustion.
2. Employ correct technique to avoid complications from the use of moxibustion.

B. Electroacupuncture

1. Know principles of using electricity with needling.
2. Employ correct technique in application of electroacupuncture.

C. Acupressure

1. Know which points respond best to acupressure.
2. Know when acupressure would be a good alternative to acupuncture.

D. Cupping

1. Know which points are appropriate for cupping.
2. Employ correct cupping technique.

IV. SAFETY: Ensure positive patient outcomes by applying safety principles.

- A. Practice universal precautions, including the use of techniques to prevent exposure to bloodborne pathogens, correct procedures for managing spills of blood and body fluids, and principles of disinfection and disposal of contaminated materials.
- B. Practice safe needle handling and disposal.
- C. Employ clean needle technique.
- D. Identify general contraindications for needling, moxibustion, and use of electrical current.
- E. Know contraindications for needling and moxibustion of specific points.
- F. Know risks of incorrect needling technique to underlying anatomical structures.
- G. Respond to non-medical complications that occur during treatment (stuck needles, broken needles, etc.).
- H. Respond to medical complications that occur during treatment (anxiety, pain at the insertion site, chest pain, dyspnea, bleeding, fainting, shock, nausea, vomiting, pneumothorax, muscle spasm, organ puncture, artery puncture, cartilage puncture, etc.).
- I. Respond to post-treatment complications (hematoma, infection at an insertion site, cellulitis, neuropathy, moxa burns, cupping bruises, etc.).
- J. Educate patient regarding possible adverse effects of treatment (e.g., moxa burn, cupping hematoma, pain at insertion site, infection, etc.).
- K. Know when to refer for urgent or emergency care.

Syndromes

1. **Lung** (10% to 15%)
 - A. Empty: Qi Deficiency, Yin Deficiency, Dryness
 - B. Full Exterior: Wind-Cold Invasion, Wind-Heat Invasion, Wind-Water Invasion (a.k.a. Wind-Damp Invasion)
 - C. Full Interior: Heat, Damp-Phlegm, Cold-Phlegm, Phlegm-Heat, Dry-Phlegm, Phlegm Fluids Obstructing
2. **Large Intestine** (5% to 10%)
 - A. Full: Damp-Heat, Heat, Heat Obstructing, Cold Invasion, Qi Stagnation
 - B. Empty: Dryness, Cold, Collapse
3. **Stomach** (5% to 10%)
 - A. Empty: Qi Deficiency, Yin Deficiency
 - B. Full: Qi Stagnation, Fire (or Phlegm-Fire), Cold Invasion, Stomach Qi Rebellious Upward, Damp-Heat, Food Retention, Blood Stasis
4. **Spleen** (5% to 10%)
 - A. Empty: Qi Deficiency, Yang Deficiency, Qi Sinking, Spleen not Controlling Blood, Blood Deficiency
 - B. Full: Cold-Damp Invasion, Damp-Heat Invasion
5. **Heart** (10% to 15%)
 - A. Empty: Qi Deficiency, Yang Deficiency, Yang Collapse, Blood Deficiency, Yin Deficiency
Full: Fire Blazing, Phlegm-Fire Harassing the Heart, Phlegm Misting the Mind
Qi Stagnation, Vessel Obstructed
 - B. Empty/Full: Blood Stasis
6. **Small Intestine** (5% to 10%)
 - A. Empty: Deficient and Cold
 - B. Full: Full-Heat, Qi Pain, Qi Tied (Qi Obstruction)
7. **Bladder** (5% to 10%)
 - A. Empty: Deficient and Cold (Kidney Yang Deficiency)
 - B. Full: Damp-Heat, Damp-Cold
8. **Kidney** (10% to 15%)
 - A. Empty: Yang Deficiency, Yin Deficiency, Qi not Firm, Failure to Receive Qi, Essence Deficiency
 - B. Empty/Full: Yin Deficiency with Empty-Heat Blazing
9. **Pericardium** (0% to 5%)
 - A. Full: Heat, Qi Stagnation, Blood Stasis
10. **Gall Bladder** (5% to 10%)
 - A. Empty: Deficient Qi
 - B. Full: Damp-Heat, Dampness
11. **Liver** (10% to 15%)
 - A. Empty: Blood Deficiency, Yin Deficiency
 - B. Full: Qi Stagnation, Rebellious Qi, Blood Stasis, Fire Blazing, Damp-Heat, Cold Stagnation
 - C. Full/Empty: Yang Rising, Wind Agitating

Example Case #1

A 36-year-old female presents with dizziness, fatigue, palpitations, poor memory, and decreased appetite. Onset was 2 months ago. Her dizziness is worse when she is fatigued, and especially after her menstrual periods, which resumed 6 months after the birth of her third child 1 year ago. She is a stay-at-home mother, and she is still breastfeeding the youngest child. Her menses have resumed and are regular, but the flow is now scanty. She sleeps well at night, and she denies having any joint pain. She is always thirsty. Her skin is dry, and her face, lips, and fingernails appear pale. Her tongue is pale. Her pulse is thin and weak.

1. What is the most likely diagnosis?
 - A. Yin Deficiency
 - B. Phlegm Stagnation
 - C. Qi and Blood Deficiency
 - D. Kidney Essence Deficiency
2. What treatment principles are most appropriate for her?
 - A. tonify Qi and Blood
 - B. tonify Kidney Yin and Blood
 - C. tonify Kidney Essence and Qi
 - D. dissolve Phlegm, tonify Qi
3. Needling which acupuncture points will most effectively address her presentation?
 - A. BL 23, CV 4, CV 6, GV 20, KI 3
 - B. BL 13, BL 23, CV 4, GV 20, KI 3
 - C. BL 13, BL 20, CV 4, SP 6, ST 36
 - D. BL 12, BL 15, BL 20, CV 12, ST 40
4. As you are removing the needles after treatment, one appears to be stuck. Which action will most safely and effectively facilitate the removal of the needle?
 - A. application of a cold wet cloth to the needle site
 - B. gentle massage in the area that surrounds the point
 - C. insertion of another needle directly next to the stuck needle
 - D. referral to ED for surgical removal

Example Case #2

A 14-year-old male presents with wheezing, a weak voice, shallow rapid breathing, a cough that produces a white watery sputum, and perspiration on exertion. He frequently experiences URI symptoms, and his mother tells you that he has always been frail. He is a student in secondary school. He is sensitive to cold, damp weather. His complexion appears pale. His pulse is thin and weak.

1. Consistent with his presentation, on physical examination you would expect his tongue to appear _____.
 - A. red, with a midline fissure
 - B. pale, with a thin white coating
 - C. red, with a thick yellow coating
 - D. pale and swollen, with scalloping on the sides
2. Which organ is primarily responsible for protecting against invasion of exterior pathogenic factors?
 - A. Lung
 - B. Spleen
 - C. Kidney
 - D. Stomach
3. Which syndrome is he most likely exhibiting?
 - A. Lung Qi Deficiency
 - B. Spleen Qi Deficiency
 - C. Kidney Yin Deficiency
 - D. Phlegm-Heat Obstructing the Lung
4. What treatment principles are most appropriate for him?
 - A. tonify Lung Qi
 - B. tonify Spleen Qi
 - C. tonify Kidney Yin
 - D. dissolve Phlegm, dispel Heat
5. To address his clinical picture, which point combination is indicated for needling?
 - A. BL 13, BL 23, CV 4, KI 6
 - B. BL 13, CV 6, LU 7, LU 9, ST 36
 - C. GV 20, LI 4, LU 5, ST 8, ST 40
 - D. BL 20, BL 21, CV 12, SP 6, ST 36

Answers to Acupuncture Example Items

Case #1: 1. C 2. A 3. C 4. B

Case #2: 1. B 2. A 3. A 4. A 5. B

**NPLEX PART II - CLINICAL ELECTIVE EXAMINATION
PARENTERAL MEDICINE COMPETENCIES & BLUEPRINT WEIGHTINGS**
(75 items)

A minimally competent entry-level naturopathic physician who will be using parenteral medicine as part of a naturopathic practice should be able to demonstrate knowledge in the following competencies:

A. GENERAL PRINCIPLES (17%-19%)

1. Know and apply the general principles of parenteral medicine to patient care, including:
 - a. fluid and electrolyte balance
 - b. pH, acid-base balance
 - c. osmolality, osmolarity, and tonicity
 - d. water solubility vs. fat solubility
 - e. flow (drip) rate
 - f. pharmacodynamics/kinetics
 - g. first and second-pass metabolism and phase I & II detoxification pathways

B. PATIENT ASSESSMENT (19-21%)

1. Evaluate whether parenteral medicine is indicated, contraindicated, or must be used with caution for patients in the following populations:
 - a. pediatric patients
 - b. adult patients
 - c. geriatric patients
 - d. special populations (pregnant and lactating patients, patients who have G6PD, MTHFR or other polymorphisms, etc.)
2. Evaluate whether parenteral therapy is indicated, contraindicated, or must be used with caution for an individual patient, based on:
 - a. patient history, presentation, and working diagnosis
 - b. physical examination and vital signs
 - c. lab tests, including:
 - i. kidney, liver and cardiac function
 - ii. nutritional assessment
 - iii. testing for special risks (polymorphisms, etc.)
3. Assess the patient to evaluate appropriateness of parenteral therapy prior to administering each treatment.
4. Recognize the indications for referral to a specialist for continuation of care or to urgent care prior to administering a treatment.

C. TREATMENT SELECTION (16-18%)

1. Select and know how to parenterally administer therapeutic agents, including:
 - a. amino acids and amino acid compounds [e.g., arginine, carnitine, glutathione (GSH), etc.]
 - b. botanicals
 - i. artemisinin/artesunate
 - ii. curcumin
 - iii. epigallocatechin gallate (EGCG)
 - iv. glycyrrhizic acid
 - v. quercetin
 - vi. resveratrol
 - vii. silymarin
 - viii. viscum album (Mistletoe)
 - c. chelation agents
 - i. DMPS
 - ii. DMSA
 - iii. edetate disodium
 - iv. edetate calcium disodium
 - d. drugs
 - i. dexamethasone
 - ii. emergency
 - a) atropine
 - b) diphenhydramine
 - c) epinephrine (adrenaline)
 - iii. ibuprofen
 - iv. ketorolac
 - v. ondansetron
 - e. fluids and solutions
 - i. 5%/D5W
 - ii. 10%/D10W
 - iii. 50%/D50W
 - iv. 0.45% saline (half-normal/hypotonic saline)
 - v. 0.9% saline (normal/isotonic saline)
 - vi. lactated Ringer's solution
 - vii. sterile water
 - f. hormones
 - i. HCG
 - ii. testosterone
 - g. nutrients
 - i. acetylcysteine
 - ii. alpha-lipoic acid
 - iii. minerals (e.g., calcium gluconate, iron dextran, zinc chloride, etc.)
 - iv. Myers'-type infusion
 - v. nicotinamide adenine dinucleotide (NAD)
 - vi. ubiquinol
 - vii. vitamins A–K

- h. other
 - i. heparin
 - ii. hydrochloric acid (HCl)
 - iii. hydrogen peroxide
 - iv. methylene blue
- 2. Determine appropriate therapeutic drug/nutrient levels.
 - a. dosage of drugs/nutrients
 - b. frequency of treatment
- 3. Provide post-treatment instructions to patients.
- 4. Recognize adverse effects of treatment observed in clinical presentation and lab test results, and modify treatment plan accordingly.
- 5. Evaluate effectiveness of treatment observed in clinical presentation and lab test results, and modify treatment plan accordingly.
- 6. Select adjunctive nutrition and lifestyle practices that complement parenteral therapy.
- 7. Demonstrate ability to clearly communicate with other healthcare providers in the co-management of patients.

D. PROCEDURES AND TECHNIQUES (16-18%)

- 1. Know standard protocols for maintaining a clean room.
- 2. Formulate safe and effective infusible solutions.
 - a. Identify appropriately certified and legally compliant compounding pharmacies.
 - b. Verify that the agents used are of the appropriate identity, strength, quality, purity, and consistency according to U.S and/or Canadian regulatory standards.
 - c. Select appropriate carrier solutions.
 - d. Recognize contraindications to combining certain therapeutic substances.
 - e. Know how to minimize particulates in in-office compounded infusible solutions.
 - f. Know how to accurately label in-office compounded infusible solutions.
 - g. Know appropriate protocols for substance storage and stale-dating.
- 3. Select appropriate equipment for each mode of administration:
 - a. injections (IM, SubQ, intradermal, etc.)
 - b. IV pushes
 - c. IV drips

4. Know how to safely and correctly administer treatments via injection, IV push, and IV drip, using principles of:
 - a. sterile technique
 - b. vein/site selection
 - c. site preparation
 - d. injection technique (using syringe & needle)
 - e. insertion technique (butterfly, angiocatheter, etc.)
 - f. port or PICC access
 - g. flow (drip) rate
 - h. IV line patency
5. Evaluate patient tolerance of treatment by monitoring:
 - a. vital signs
 - b. systemic signs and symptoms during and immediately after infusion (hypoglycemia, allergic reaction, arrhythmia, cardiac arrest, etc.)
 - c. insertion site reactions during and immediately after infusion (infiltration, extravasation, etc.)

E. SAFETY (19-21%)

1. Apply principles of patient risk assessment based on medical history, clinical presentation, mental status, lab values, medications, and disease progression/regression.
2. Recognize and know how to address complications of parenteral treatment, including:
 - a. local (phlebitis, local infection, etc.)
 - b. systemic (septicemia, embolism, etc.)
 - c. interactions with other nutrients and drugs the patient is taking
3. Know how to respond to events requiring first aid or emergency protocols using:
 - a. emergency medications (epinephrine HCl, diphenhydramine chloride, calcium gluconate/chloride, glucagon, etc.)
 - b. oxygen administration
 - c. CPR, BCLS
 - d. emergency equipment (pulse oximeter, AED, etc.)
4. Know how to apply universal precautions required in treatment setting, including equipment disposal measures.
5. Know when and how to deploy practitioner safety measures required in the treatment setting (use of PPE, prevention of needle sticks, etc.)
6. Know standard protocols for appropriate facility cleaning.

F. ETHICAL AND LEGAL CONSIDERATIONS (7-9%)

1. Recognize and appropriately respond to potential ethical issues, including:
 - a. permission to access an implanted line when not in the original provider's facility
 - b. use of substances for which there is insufficient evidence of efficacy
 - c. how practice is advertised to the public
2. Demonstrate knowledge of legally sound administrative practices, including:
 - a. informed consent forms and procedures, including PARQ (Procedures, Alternatives, Risks, and Questions)
 - b. comprehensive charting/documentation
 - c. document retention requirements
 - d. incident reporting

CONDITIONS TREATED WITH PARENTERAL MEDICINE

1. dehydration
2. nutrient deficiencies (iron deficiency anemia, etc.)
3. digestive compromise (IBS, IBD, celiac disease, post-GI surgery, etc.)
4. hepatic and pancreatic impairment
5. acute infections (pneumonia, influenza, COVID-19, etc.)
6. chronic infections (Lyme disease, MRSA, HPV, herpes, hepatitis, etc.)
7. immune compromise (HIV, autoimmune, etc.)
8. chronic health conditions (CFS/ME, peripheral neuropathy, fibromyalgia, post-COVID syndrome, etc.)
9. cancer and adverse effects of cancer treatment
10. wellness support (immune boosts, performance enhancement, sports recovery, etc.)
11. heavy metal overload

Example #1

As you prepare to withdraw an injectable product from a multidose vial, you notice that the vial has been previously opened. This product is only safe to administer for a maximum of _____ after the vial has been opened.

- A. 1 day
- B. 14 days
- C. 28 days
- D. 45 days

Example #2

When assessing a patient's peripheral IV site, you observe a streak of red along the vein path and palpate a 4.0 cm venous cord. What is the most accurate documentation of this finding?

- A. infection at IV site
- B. infiltration at IV site
- C. grade 3 phlebitis at IV site
- D. thrombosed area at IV site

Example #3

Shortly after the start of an IV infusion in the cephalic vein, your patient reports a "pins and needles" sensation in the wrist and hand below the IV site. What should you do?

- A. Discontinue the IV and start it at another site.
- B. Check for the presence of a strong blood return.
- C. Elevate the extremity above the level of the heart.
- D. Document the finding and continue to monitor the IV site.

Example #4

In an older adult receiving IV therapy, infection can be prevented by _____.

- A. shaving the skin before attempting venipuncture
- B. using maximum friction when cleansing the skin
- C. avoiding the use of alcohol pads when removing tape
- D. applying a skin protectant before applying the dressing

Answers to Parenteral Medicine Example Items

1. C 2. C 3. A 4. D

ABBREVIATIONS THE EXAMINEE IS EXPECTED TO KNOW

In addition to basic standard nomenclature (e.g., CO₂, HCl), examinees are expected to know what the following abbreviations mean.

5-HTP	5-hydroxytryptophan	CVA	cerebrovascular accident (stroke)
ABC/CAB	airway, breathing, circulation circulation, airway, breathing (new standards)	CVAD	central venous access device
ABI	ankle brachial index	CVD	cardiovascular disease
ACE	angiotensin converting enzyme	CYP	cytochrome P450 enzyme system
ACTH	adrenocorticotrophic hormone	D&C	dilation and curettage
AD(H)D	attention deficit (hyperactivity) disorder	D5W	5% dextrose in water
ADH	antidiuretic hormone (vasopressin)	D10W	10% dextrose in water
ADL	activities of daily living	DCIS	ductal carcinoma in situ
AED	automated external defibrillator	DES	diethylstilbestrol
AFP	alpha-fetoprotein	DEXA	(DXA) dual energy X-ray absorptiometry
AIDS	acquired immunodeficiency syndrome	DGL	deglycyrrhizinated licorice
AKI	acute kidney injury	DHA	docosahexaenoic acid
ALP	alkaline phosphatase	DHEA	dehydroepiandrosterone
ALS	amyotrophic lateral sclerosis	DIC	disseminated intravascular coagulation
ALT	alanine aminotransferase	DJD	degenerative joint disease
ANA	anti-nuclear antibody	DM	diabetes mellitus
ANS	autonomic nervous system	DMAE	dimethylaminoethanol
ARDS	acute respiratory distress syndrome	DMSO	dimethyl sulfoxide
ASO	antistreptolysin-O titer	DNR	do not resuscitate
AST	aspartate aminotransferase	DOE	dyspnea on exertion
ATP	adenosine triphosphate	DTaP/Tdap	diphtheria-tetanus-acellular pertussis vaccine/tetanus-diphtheria-acellular pertussis vaccine
AV	atrioventricular node	DSM	diagnostic statistical manual
BLS	basic life support	DT	delirium tremens
BMI	body mass index	DTR	deep tendon reflexes
BNP	brain natriuretic peptide	DUI	driving under the influence (DWI)
BPH	benign prostatic hyperplasia	DVT	deep vein thrombosis
BP	blood pressure	EBV	Epstein-Barr virus
bpm	beats per minute	ECG/EKG	electrocardiogram
BPPV	benign paroxysmal positional vertigo	Echo	echocardiogram
BUN	blood urea nitrogen	E. coli	Escherichia coli
CA	cancer	ED/ER	emergency department/emergency room
CAD	coronary artery disease	EEG	electroencephalograph
CBC	complete blood count	EFA	essential fatty acids
CDSA	comprehensive digestive stool analysis	ELISA	enzyme linked immunosorbent assay
CEA	carcinoembryonic antigen	EMG	electromyogram
CHF	congestive heart failure	EMS	emergency medical services/ electronic muscle stimulation
CK	creatine kinase	EOM	extraocular movements
CKD	chronic kidney disease	EPA	eicosapentaenoic acid
CMV	cytomegalovirus	EPI	epinephrine
CNS	central nervous system	EPMS	extrapyramidal motor system
COPD	chronic obstructive pulmonary disease	EPO	erythropoietin
CPAP	continuous positive airway pressure	ESR	erythrocyte sedimentation rate
CPK	creatine phosphokinase	ETOH	ethyl alcohol
CPR	cardiopulmonary resuscitation	FBAO	foreign body airway obstruction
CRH	corticotropin-releasing hormone	FEV	forced expiratory volume
CRP	C-reactive protein	FOS	fructooligosaccharide
CSF	cerebrospinal fluid	FSH	follicle-stimulating hormone
CSP	comprehensive stool profile	FTI	free thyroxine index
CT	computerized tomography		

FVC	forced vital capacity	LFT	liver function tests
G6PD	glucose-6-phosphate-dehydrogenase	LGBTQ+	lesbian/gay/bisexual/transgender+
G#P#	gravidity para (pregnancies/live births)	LH	luteinizing hormone
GABA	gamma-aminobutyric acid	LLQ	left lower quadrant
GALT	gut-associated lymphoid tissue	LoC	level of consciousness
GC	gonorrhea/gonococcus	LOC	loss of consciousness
GCS	Glasgow Coma Scale	LUQ	left upper quadrant
GDM	gestational diabetes mellitus	LMP	last menstrual period
GERD	gastroesophageal reflux disease	LP(a)	lipoprotein (a)
GFR	glomerular filtration rate	MAOI	monoamine oxidase inhibitor
GGT	gamma-glutamyl transferase	MCH	mean corpuscular hemoglobin
GI	gastrointestinal	MCHC	mean corpuscular hemoglobin concentration
GnRH	gonadotropin-releasing hormone	MCV	mean corpuscular volume
GU	genitourinary	MI	myocardial infarction
HA	headache	MMPI	Minnesota Multiphasic Personality Inventory
HAV	hepatitis A virus	MMR	measles, mumps, and rubella vaccine
HbA1c	glycosolated hemoglobin	MMSE	mini mental state exam
HBV	hepatitis B virus	MPV	mean platelet volume
hCG	human chorionic gonadotropin	MRA	magnetic resonance angiography
hct	hematocrit	MRI	magnetic resonance imaging
hgb	hemoglobin	MRSA	methicillin-resistant Staph aureus
HCV	hepatitis C virus	MS	multiple sclerosis
HDL	high density lipoprotein	MSM	methylsulfonylmethane
HEENT	head, eyes, ears, nose, throat	MVA/MVC	motor vehicle accident/collision
HIV	human immunodeficiency virus	NAC	N-acetyl cysteine
HLA	human leukocyte antigen	NIDDM	non-insulin dependent diabetes mellitus
HPA	hypothalamic-pituitary-adrenal (axis)	NKDA	no known drug allergy
HPV	human papillomavirus	npo	nothing per orum (nothing by mouth)
HRT	hormone replacement therapy	NS	normal saline (or non significant)
HSV	herpes simplex virus	NSAID	non-steroidal anti-inflammatory drug
HTN	hypertension	O2 sat	oxygen saturation
HUS	hemolytic uremic syndrome	OA	osteoarthritis
IBD	inflammatory bowel disease	OC	oral contraceptive
IBS	irritable bowel syndrome	OTC	over-the-counter
IDDM	insulin dependent diabetes mellitus	O&P	ova and parasite
IgA	immunoglobulin A	PABA	para-aminobenzoic acid
IgD	immunoglobulin D	PAC	premature atrial contractions
IgE	immunoglobulin E	Pap	Papanicolaou (test for cervical pathology)
IgG	immunoglobulin G	PAT	paroxysmal atrial tachycardia
IgM	immunoglobulin M	PCR	polymerase chain reaction
IM	intramuscular	PE	physical examination
INR	international normalized ratio	PERRLA	pupils equal, round, reactive to light and accommodation
IR	infrared	PET	positive emission tomography
ITP	immune thrombocytopenia	PCOD/PCOS	polycystic ovary disease
IU	international units	PDW	platelet distribution width
IUD	intrauterine device	PFT	pulmonary function tests
IV	intravenous	PID	pelvic inflammatory disease
IVP	intravenous pyelogram	PIP/DIP	proximal/distal interphalangeal joints
IVU	intravenous urogram	PKU	phenylketonuria
JVD	jugular venous distension	PMI	point of maximal impulse
KOH	potassium hydroxide	PMN	polymorphonuclear lymphocyte
KUB	kidney-ureter-bladder	PMS	premenstrual syndrome
LCIS	lobular carcinoma in situ	prn	pro re nata (as needed)
LDH	lactate dehydrogenase	PSA	prostate specific antigen
LDL	low density lipoprotein		

PSVT	paroxysmal supraventricular tachycardia	SSRI	selective serotonin re-uptake inhibitor
PT	prothrombin time	stat	statim (immediately)
PTSD	post traumatic stress disorder	STI/STD	sexually transmitted infection
PTT	partial thromboplastin time	sTSH	sensitive thyroid-stimulating hormone
PUFA	polyunsaturated fatty acids	SQ/SubQ	subcutaneous
PVC	premature ventricular contractions	T3	triiodothyronine
RA	rheumatoid arthritis	T4	thyroxine
RAI	radioactive iodine (uptake test)	TAB	therapeutic abortion
RAST	radio allergen sorbent test	TB	tuberculosis
RBC	red blood cells	TENS	trans electrical nerve stimulation
RDA	recommended daily allowance	TIA	transient ischemic attack
RDW	red cell distribution width	TIBC	total iron binding capacity
RF	rheumatoid factor	TKO	to keep open (IV)
Rh	rhesus factor	TMD	temporomandibular disorder
RICE	rest, ice, compression, elevation	TPN	total parenteral nutrition
RLQ	right lower quadrant	TPO	thyroid peroxidase
ROM	range of motion	TRH	thyroid-releasing hormone
RPR	rapid plasma reagin	TSH	thyroid-stimulating hormone
RRR	regular rate and rhythm	UA	urinalysis
RSV	respiratory syncytial virus	URI	upper respiratory infection
RUQ	right upper quadrant	USP	United States Pharmacopeia
SA	sinoatrial node	UTI	urinary tract infection
SAB	spontaneous abortion	UV	ultraviolet (including UVA, UVB, UVC)
SAD	standard (North) American diet (omnivorous and refined-food diet)	VDRL	veneral disease research laboratory test
SAMe	S-adenosyl methionine	VLDL	very low density lipoprotein
sl	sublingual/sublingually	VMA	vanillylmandelic acid
SLE	systemic lupus erythematosus	VO2	(ventilatory) oxygen consumption
SOB	shortness of breath	VRSA	vancomycin-resistant Staph aureus
SOD	superoxide dismutase	WBC	white blood cell
SPECT	single photon emission CT	WNL	within normal limits

SUGGESTIONS FOR A STUDY STRATEGY

1. **Begin your review early.**

Expect to spend 6 - 8 hours per day studying during the months before the exam administration.

2. **Budget additional study time for weak areas.**

Begin your studies by identifying your areas of weakness within the competencies. Distribute your allotted study time by beginning with areas of particular weakness and then returning to these topics right before the testing date.

3. **Familiarize yourself with the testing format and procedures.**

Questions are all multiple choice with one **best** answer and three incorrect responses (distractors). If you have not taken multiple-choice tests before, take some practice tests. Study guides produced by individuals or organizations not affiliated with NPLEX can be useful in preparing to take the examination, but NPLEX does not warrant that the information contained in these materials is representative of the content of the NPLEX examinations.

4. **Expect the examinations to be challenging.**

NPLEX examinations are developed in accordance with national testing standards. NPLEX trains item writers in the principles of writing clear items. Every item is reviewed by at least nine NDs and edited to ensure that it is as straightforward as possible. You should, however, expect the items to be intellectually challenging.

5. **Approach the exam process with a positive attitude.**

If you approach your study time with the attitude that this is your chance to synthesize what you have learned in the past 4 years of school (instead of having the attitude that this is just one more hurdle you must clear), you will minimize the impact that a negative attitude can have on your performance. NABNE suggests that you prepare for the NPLEX not merely to pass the examination, but to reinforce the base of your knowledge, allowing you to enter the naturopathic profession with confidence. The privilege of being eligible to take national board-level examinations that are accepted by regulatory authorities is part of what sets you apart from graduates of correspondence and non-accredited schools.

SUGGESTIONS FOR TAKING AN NPLEX MULTIPLE-CHOICE EXAMINATION

The NPLEX Part II - Clinical Science Examinations are designed to assess your technical knowledge in critical areas of naturopathic medicine. If you take these examinations soon after you graduate from naturopathic college, the information will be fresh in your mind.

The first step in preparing to take the examinations is to look at the examples of case clusters and note how they are formatted. Questions relate to the preceding case, and all questions on NPLEX examinations follow one format: multiple-choice with one correct answer and three distractors.

In preparing to take the NPLEX, there is no quick substitute for years of study. Cramming the night before the examination will usually not improve your score. It is more important to relax and get a good night's sleep. Expect to have some anxiety; this can actually add to mental alertness.

To avoid two common errors associated with filling out the NPLEX exam answer sheet, keep these guidelines in mind:

- First, the bubbles must be filled in **darkly** and **completely**. If a mark is too light or only fills part of the bubble, the scanner might score that item as unanswered and you will not be given credit for it. Erasures should be made completely. If there is still a mark in the bubble, the optical scanner might be unable to interpret which mark you intended, and you will not receive credit for any answer.
- Second, make sure that the line on the answer sheet corresponds to the question being answered. For example, if the answer to item 4 is put on the line on the answer sheet for number 5, all the rest of your answers will be entered on the wrong line.

You may write on your exam booklets, but **ALL ANSWERS MUST BE ENTERED ON THE ANSWER SHEET**.

When responding to a question on the NPLEX Part II - Clinical Science Examinations, you will be required to use your clinical judgement. Choose the **best** answer from those given, based on only the information given in the clinical presentation. Do not overthink your answer; usually your first impulse will be the best. If you overthink a question, you might recall information from specific cases that will lead you away from the response alternative that will be true in **most** cases. You might never encounter a classic textbook case in your naturopathic practice.

There are no "trick" questions. Item writers have made every effort to write items in a straightforward manner. When you come to an item for which you do not know the answer with absolute certainty, try to eliminate some of the responses. If after eliminating one or two of the responses you still are not sure of the answer, make your best guess from among the remaining choices. Some of the items will be very challenging. You are not expected to be able to answer every question correctly. Usually you only need to answer 60 to 70% of the items correctly in order to pass.

Pace yourself. Some items are more time-consuming than others, and while you should have no trouble completing the entire examination in the time allotted, spending too much time on one item might make you feel pressured to speed through the rest. **If you skip an item, be sure you skip the corresponding line on your answer sheet.** As the penalty for an unanswered item is the same as that for an incorrect response, you might want to mark your best guess on a difficult item and return to it later if you have time.

Finally, remember that not everyone will pass the examination on the first attempt. You should have a contingency plan for what you will do if you cannot be licensed immediately after you take the examinations the first time. Knowing that you **MUST** pass the examination (e.g., because a practice opportunity is waiting for you) will add pressure and anxiety and might cause you to perform below your true level of ability. Having a contingency plan will ease some of that pressure and allow you to function at your best.

THE NPLEX PROCESS

EXAM DEVELOPMENT: Exam items are written and referenced by NDs and other qualified professionals in the US and Canada. Items are screened, reviewed, and rewritten as necessary by Local Exam Committee members who are practicing NDs. New items are added to a computer item bank for each exam administration. Several committees review the individual items and the compiled cases. Before it is used on an examination, every item is reviewed by at least nine NDs for accuracy, relevance, and appropriateness. The examinations are edited and proofread. After corrections are made, exam booklets are produced and sent to the test sites for administration.

ESTABLISHING THE PASSING SCORE: Because NPLEX examinations are criterion-referenced, each examination has a passing score that is independent of the passing scores of other examinations. The Angoff method (a nationally accepted testing standard) is used to establish this score. Naturopathic physicians rate the difficulty of each exam item by answering the question, “What percentage of minimally competent entry-level naturopathic physicians should be able to answer this item correctly?” These ratings are averaged to determine the cut score for each exam item. Then the cut scores for every item relating to each general exam area (GEAs: *Diagnosis, Materia Medica, Other Modalities, and Medical Interventions*) are averaged to determine the cut score for that exam area. Examinations that are judged to be difficult have lower cut scores than easy examinations (i.e., for a difficult examination, the examinee will be required to answer fewer questions correctly in order to pass). Cut scores are set before answer sheets are scored.

SCORING THE EXAMINATIONS: Due to an extensive post-test analysis process, it takes approximately 6 weeks to complete the scoring process. Exam answer sheets are scanned by an optical scanner using the latest technology. Reports and statistics are calculated without reference to any individual’s scores. Item analyses and exam summary information are prepared for use in the post-test analysis (PTA).

POST-TEST ANALYSIS: The purpose of the post-test analysis (PTA) is to review exam items that do not perform as expected on the item analysis. Using standard reference texts, the Exam Chair reviews these items to verify that the keyed answer is correct and that there is only one correct answer. Items are reviewed for clarity. The Exam Chair submits recommendations to the PTA Committee, who makes the final decision regarding disposition of the item. Credit may be given for more than one answer, or the item may be deemed valid and appropriate in which case no key changes are made. After a decision has been made about every item in question, changes are made to the scoring key and all examinations are re-scored. This process is done to ensure that the items on which the examinee’s results are based are appropriate and fair.

CUT SCORE ANALYSIS AND BOARD REVIEW OF RESULTS: Before the exam results are sent out, the NPLEX Board reviews individual exam results and the scoring process to ensure that pass/fail decisions are appropriate.