



**NPLEX<sup>®</sup>**

Naturopathic Physicians Licensing Examinations

**Part II - Clinical Science Examinations:  
Blueprint and Study Guide**

[Revised September 2024]  
Applicable to February 2025 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](http://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 reliable and valid board-level licensing examinations for the naturopathic medical profession in the US, including Puerto Rico, and parts of Canada. Governmental 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.

Competency in both the biomedical sciences and the clinical sciences is necessary to ensure that the candidate for licensure has the entry level knowledge and skills 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 Examinations are designed to measure a graduate's entry level readiness to practice naturopathic medicine, assessing mastery of the competencies derived from a survey of naturopathic physicians who are active in the profession. This *Study Guide* incorporates the results of the latest (2022) Core Clinical Science naturopathic practice analysis.

The NPLEX *Blueprint and Study Guide* lists the competencies and topics that the entry-level naturopathic physician 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, and Acupuncture]. Other sections provide information on the structure of exam items with some examples, suggestions on how to study for and take an NPLEX examination, the post-examination scoring process, and a list of abbreviations examinees are 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: examinees may encounter exam items that do not fit into a single body system, and items will not be in the same order on the examination as on the list of competencies.

NPLEX is committed to creating examinations that are free from implicit bias. We recognize the impact of genetics, gender identity, disability, socioeconomic status, and cultural orientation on individuals; however, NPLEX cases do not include information regarding these factors 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, and spiritual). An entry level 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 listed 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 5-8 list the competencies that the graduate is expected to have mastered. The NPLEX Board has limited to a representative sample the numbers of "topics" the examinee is required to know. These topics (conditions, tests, botanical medicines, homeopathic medicines, and pharmacotherapeutic agents) are listed in pages 9-23, and include:

1. **Conditions** that are most frequently seen by a naturopathic physician 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 physician should be able to perform and interpret<sup>1</sup>;
3. The **types of lab tests and diagnostic imaging studies** the entry-level 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 physician is most likely to see in practice.

The content emphasis 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.

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<sup>1</sup> 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 9-14)
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: 19-20%)

**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 17-19)
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: 28-29%)

**A. Manage patient care by applying principles of clinical nutrition.** (10-11%)

1. Assess a patient's 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. (8-9%)**

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. (8-9%)**

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 21-23)
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

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

1. **cancers** (leukemia [CLL, CML], Hodgkin and non-Hodgkin lymphoma, multiple myeloma)
2. **infections and inflammations** (babesiosis, malaria, sepsis)
3. **lymphatic system disorders** (lymphadenitis, lymphangitis, lymphedema)
4. **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])
5. **myeloproliferative disorders** (polycythemia vera, secondary polycythemia)
6. **coagulation and platelet disorders** (disseminated intravascular coagulation, hemophilia A/factor VIII deficiency, immune thrombocytopenia, vitamin K deficiency, von Willebrand disease)
7. **porphyrias** (acute intermittent porphyria, erythropoietic protoporphyria, porphyria cutanea tarda)

#### B. Conditions of the cardiovascular system (9%)

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

#### C. Conditions of the endocrine system (7%)

1. **neoplasms** (adrenal, pancreatic, parathyroid, pituitary, thyroid)
2. **hypothalamic and pituitary hormone disorders** (hyposcretion [panhypopituitarism, galactorrhea, growth hormone deficiency, diabetes insipidus], hypersecretion [acromegaly, hypercortisolism (Cushing disease), syndrome of inappropriate ADH secretion])
3. **thyroid disorders (autoimmune)** (Hashimoto) thyroiditis, hyperthyroidism, hypothyroidism [primary, secondary, subclinical], non-toxic goiter)
4. **parathyroid disorders** (hyperparathyroidism, hypoparathyroidism)
5. **adrenal disorders** (hypocortisolism (Addison disease), hypercortisolism (Cushing syndrome), functional adrenal disorders, hyperaldosteronism)
6. **pancreatic disorders** (diabetes mellitus type 2, reactive hypoglycemia, hyperinsulinemia, insulin resistance, metabolic syndrome)
7. **other** (late-onset hypogonadism, menopause, PCOS)

**D. Conditions of the gastrointestinal and hepatobiliary systems (9%)**

1. **neoplasms** (colorectal, esophageal, gallbladder, gastric, hepatic)
2. **infections and inflammation** (GI abscess, pancreatitis, peritonitis)
3. **esophageal disorders** (Barrett esophagus, eosinophilic esophagitis, esophageal motility disorder, esophageal strictures, esophageal varices, GERD, hiatal hernia)
4. **stomach disorders** (gastric ulcer, gastritis)
5. **hepatic disorders** (cirrhosis, hepatitis [A, B, C, non-infectious], non-alcoholic steatohepatitis, primary biliary cholangitis)
6. **gallbladder disorders** (cholecystitis, cholelithiasis)
7. **intestinal disorders** (appendicitis, autoimmune gluten-sensitive enteropathy and gluten sensitivity, diverticulitis, diverticulosis, duodenal ulcer, inflammatory bowel disease [regional enteritis (Crohn disease), ulcerative colitis], hernia [inguinal, umbilical], ileus, intestinal polyps, Meckel diverticulum, megacolon)
8. **rectal disorders** (anorectal strictures, cryptitis, fissures, fistula, hemorrhoids, polyps, proctitis, rectal prolapse)
9. **functional disorders of the GI and hepatobiliary system** (food allergies/intolerances, hypochlorhydria, intestinal dysbiosis [candidiasis and small intestinal bacterial overgrowth], irritable bowel syndrome)
10. **trauma** (injuries involving the abdominal cavity, poisoning)
11. **other disorders impacting public health** (acute and chronic diarrhea [bacterial and viral gastroenteritis, parasitic infections])

**E. Conditions of the head and neck (5%)**

1. **neoplasms** (laryngeal, oral [gingival, tongue, tonsillar])
2. **infections** (cytomegalovirus, diphtheria, mastoiditis, mononucleosis/EBV)
3. **eye disorders** (acute closed-angle glaucoma, blepharitis, conjunctivitis, detachments [retinal, vitreous], keratitis, optic neuritis, orbital cellulitis, pterygium, retinal hemorrhage, retinopathy [diabetic, hypertensive], uveitis)
4. **ear disorders** (cholesteatoma, idiopathic endolymphatic hydrops (Ménière disease), otosclerosis, ruptured tympanic membrane,
5. **vertigo due to inner ear disorders** [benign paroxysmal positional vertigo, labyrinthitis], other vestibular disorders)
6. **nose and sinus disorders** (allergic rhinitis, nasal polyps, sinusitis, sinus headache)
7. **mouth and throat disorders** (candidiasis, dental abscess, gingivitis, glossitis, herpangina, laryngitis, leukoplakia, parotitis, peritonsillar abscess, pharyngitis, retropharyngeal abscess, sialolithiasis, stomatitis, tonsillitis)
8. **trauma** (foreign bodies, non-neurological injuries)

**F. Conditions of the immune system (7%)**

1. **immune deficiency disorders** (HIV/AIDS, IgA deficiency)
2. **autoimmune disorders** (ankylosing spondylitis, myasthenia gravis, polymyositis, reactive arthritis, rheumatoid arthritis, scleroderma, Sjögren syndrome, systemic lupus erythematosus, vasculitis [temporal (giant cell) arteritis, IgA vasculitis (Henoch-Schönlein purpura), necrotizing vasculitis, polyarteritis nodosa])
3. **hypersensitivity disorders** (allergies, anaphylaxis, angioedema, urticaria)
4. **other** (chronic fatigue syndrome, disorders of mitochondrial function [fibromyalgia])

#### G. Conditions of the musculoskeletal system (9%)

1. **neoplasms** (chondroma, osteochondroma, osteoid osteoma, osteoma, osteosarcoma)
2. **infections and inflammations** (arthritis [psoriatic, septic], bursitis, degenerative disc disease, degenerative joint disease, gout, Lyme disease, tendinopathy)
3. **bone disorders** (Paget disease of the bone, osteomalacia, osteomyelitis, osteopenia, osteoporosis)
4. shoulder and arm disorders (adhesive capsulitis, rotator cuff injury/tendinopathy, thoracic outlet syndrome)
5. **elbow disorders** (epicondylitis, ulnar nerve entrapment)
6. **hand and wrist disorders** (carpal tunnel syndrome, de Quervain tenosynovitis, Dupuytren contracture, ganglion/synovial cyst)
7. **spinal disorders** (cervical disorders [discopathy, spondylosis, torticollis]; thoracic disorders [costochondritis, discopathy, facet syndrome]; lumbar and sacral disorders [discopathy, sciatica, spondylolisthesis]; postural disorders; spinal stenosis)
8. **hip and thigh disorders** (avascular necrosis of the femoral head, iliotibial band syndrome)
9. **knee disorders** (popliteal [Baker] cyst, ligamentous disorders, meniscal disorders, patellofemoral syndrome)
10. **leg and ankle disorders** (medial tibial stress syndrome)
11. **foot disorders** (functional disorders of the foot [pes planus/cavus], hallux malleus, hallux valgus, Morton neuroma, plantar fasciitis)
12. **trauma** (disc herniation, disc rupture, dislocation, fracture, separation, spasm, sprain, strain, tear, tendon rupture, whiplash)
13. **other** (complex regional pain syndrome, muscular dystrophy)

#### H. Conditions of the nervous system (8%)

1. **neoplasms** (acoustic neuroma, astrocytoma, glioma, glioblastoma multiforme, meningioma)
2. **infections and inflammations** (acute inflammatory demyelinating neuropathy [Guillain-Barré syndrome], botulism, encephalitis, herpes zoster, meningitis, neuropathy, polio, rabies, radiculitis, tetanus)
3. **vascular disorders** (arteriovenous malformations, cerebral aneurysm, cerebrovascular accident, transient ischemic attacks)
4. **headaches** (cluster, migraine, tension, temporomandibular joint disorder)
5. **other neurological head disorders** (acute peripheral facial [Bell] palsy, vertigo not related to inner ear disorders, trigeminal neuralgia)
6. **seizure disorders** (partial/focal, general [absence, myoclonic, tonic, tonic-clonic, atonic])
7. **neurodegenerative diseases** (amyotrophic lateral sclerosis, Huntington disease, multiple sclerosis, Parkinsonism, peripheral neuropathy, post-polio syndrome)
8. **trauma** (causes of neurological injury [chronic traumatic encephalopathy, intracranial hemorrhage, shock, toxic exposure, traumatic brain injury])

#### I. Conditions of the respiratory system (7%)

1. **neoplasms** (adenocarcinoma, mesothelioma, non-small cell carcinoma, superior sulcus [Pancoast] tumor, small cell [oat cell] carcinoma)
2. **infections and inflammations** (blastomycosis, coccidioidomycosis, coronaviruses, histoplasmosis, influenza)
3. **bronchial disorders** (bronchiectasis, bronchitis)
4. **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)
5. **trauma** (airway obstruction, thoracic injuries with pulmonary implications)

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

1. **cancerous and pre-cancerous lesions** (actinic keratosis, basal cell carcinoma, Kaposi sarcoma, melanoma, squamous cell carcinoma)
2. **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)
3. **benign skin lesions** (acanthosis nigricans, acrochordons, lichenification, lipoma, sebaceous cysts, seborrheic keratosis, verrucae)
4. **immune-mediated disorders** (bullous pemphigoid, atopic dermatitis, contact dermatitis, dermatitis herpetiformis, erythema multiforme, pemphigus, psoriasis, urticaria, vitiligo)
5. **trauma** (bites, burns, foreign bodies, lacerations)

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

1. **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)
2. **infections** (pelvic inflammatory disease, toxic shock syndrome)
3. **urinary tract disorders** (cystitis, glomerulonephritis, interstitial cystitis, nephrosclerosis, nephrosis/nephrotic syndrome, polycystic kidney, pyelonephritis, chronic kidney disease and acute kidney injury, renal glycosuria, urethritis, urolithiasis [cystolithiasis, nephrolithiasis])
4. **uterine and pelvic disorders** (endometrial hyperplasia, endometriosis, endometritis, polyps, uterine prolapse)
5. **vaginal disorders** (vulvar [Bartholin] cyst, colpocele, cystocele, dyspareunia, rectocele, vaginitis [bacterial, candidal, trichomonal])
6. **ovarian disorders** (mittelschmerz/mid-cycle pain, ovarian cysts)
7. **cervical disorders** (cervical dysplasia, nabothian cysts)
8. **vulvar disorders** (lichen sclerosus, vulvitis, vulvodynia)
9. **menstrual disorders** (amenorrhea, dysmenorrhea, menorrhagia, metrorrhagia, oligomenorrhea, pre-menstrual syndrome)
10. **female fertility disorders** (infertility due to cervical and uterine abnormalities, hormonal imbalances, immunologic incompatibility, metabolic abnormalities, nutritional deficiencies, ovarian failure, tubal obstruction)
11. **male fertility disorders** (infertility due to ductal obstruction, ejaculatory abnormalities, hormonal imbalances, sperm and semen abnormalities)
12. **erectile dysfunction** (endocrinologic, neurologic, pharmacologic, psychogenic, vascular)
13. **penile and testicular disorders and benign masses** (balanitis, epididymitis, hematocele, hydrocele, orchitis, paraphimosis, phimosis, testicular torsion, spermatocele, varicocele)
14. **prostatic disorders** (benign prostatic hyperplasia, prostatitis)
15. **sexually transmitted infections** (chancroid, chlamydia, condylomata acuminata, condyloma lata, gonorrhea, herpes simplex type II, human papillomavirus, lymphogranuloma venereum, syphilis)
16. **trauma** (foreign bodies, injuries)

**L. Conditions of the breasts and axillae (3%)**

1. **neoplasms** (breast cancer [DCIS, LCIS, inflammatory, invasive], fibroadenoma, fibrocystic breast disease, Paget disease of the breast)
2. **infections** (mastitis)
3. **other** (gynecomastia)

**M. Conditions related to pregnancy (4%)**

1. **masses** (gestational trophoblastic disease/hydatidiform mole)
2. **maternal infections** (group B streptococcus, toxoplasmosis)
3. **general pre- and postnatal care and symptoms commonly associated with pregnancy** (constipation, hemorrhoids, leg cramps, nausea and vomiting, urinary tract infection, vaginitis, varicose veins)
4. **maternal antepartum disorders** (anemia, gestational diabetes, hyperemesis gravidarum, gestational hypertension, polyhydramnios, preeclampsia)
5. **obstetric emergencies** (abruptio placentae, eclampsia, ectopic pregnancy, placenta previa, postpartum hemorrhage, precipitous birth, pre-term labor, prolapsed cord, retained placenta, Rh factor incompatibility, threatened and spontaneous abortion)
6. **maternal postpartum disorders** (depression, lactation disorders, postpartum thyroiditis, symphysis pubis dysfunction)

**N. Conditions generally pertaining to pediatrics (5%)**

1. **neoplasms** (leukemia [ALL, AML], Ewing sarcoma, neuroblastoma, nephroblastoma, osteosarcoma, retinoblastoma)
2. **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)
3. **behavioral disorders** (adjustment disorder, attention deficit disorder/attention deficit hyperactivity disorder, conduct disorder, oppositional defiant disorder, pervasive developmental disorder, reactive attachment disorder, separation anxiety disorder, Tourette syndrome)
4. **congenital disorders** (anal stenosis, cerebral palsy, congenital hypothyroidism, Hirschsprung disease)
5. **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)
6. **gastrointestinal disorders** (colic, encopresis, functional constipation, functional diarrhea, intussusception, meconium ileus, pyloric stenosis)
7. **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)
8. **respiratory disorders** (asthma, bronchiolitis, laryngotracheobronchitis [croup], cystic fibrosis, epiglottitis, infant respiratory distress syndrome, respiratory syncytial virus)
9. **trauma** (abuse [emotional, physical, sexual])
10. **other** (dacrocystitis, Fanconi syndrome, diabetes mellitus type 1, hemangioma, plumbism, pediatric febrile seizures, trisomy 21)

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

1. **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])
2. **circulatory disorders** (aneurysm, peripheral vascular disease)
3. **dementia** (Alzheimer disease, non-Alzheimer dementia)
4. **musculoskeletal disorders** (osteoarthritis, osteoporosis, polymyalgia rheumatica)
5. **nervous system disorders** (cerebrovascular accident, Parkinson disease, transient ischemic attacks)
6. **ocular disorders** (cataracts, glaucoma, macular degeneration)
7. **trauma** (elder abuse, falls, fracture)

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

1. **psychotic disorders** (brief reactive psychosis, delusions, hallucinations, paranoia, schizophrenia)
2. **mood disorders** (bipolar disorder, cyclothymia, depression, dysthymia, mania, seasonal affective disorder)
3. **cognitive mental disorders** (delirium, dementia)
4. **anxiety disorders** (agoraphobia, generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, phobias, post-traumatic stress disorder)
5. **somatoform and factitious disorders** (adjustment disorder with physical complaints, conversion disorder, eating disorders, hypochondriasis, malingering, Munchausen syndrome, Munchausen syndrome by proxy, somatic symptom disorder)
6. **sexual disorders** (genito-pelvic pain/penetration disorder, pedophilic disorder, sadism/masochism, voyeuristic disorder)
7. **personality disorders** (antisocial, avoidant, borderline, dependent, histrionic, narcissistic)
8. **substance-related and addictive disorders** (alcohol, cannabis, caffeine, hallucinogens, nicotine, opioids, prescription drugs, recreational drugs)
9. **non-substance-related compulsive disorders** (compulsive buying, gambling, hoarding, kleptomania, sex)
10. **trauma** (domestic violence, child sexual abuse, rape)
11. **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**

### **A. Orthopedic tests: vertebral column**

1. Adam forward-bend test
2. Adson and reverse Adson tests
3. Braggard test
4. Bechterew test
5. cervical spine compression test
6. cervical spine distraction test
7. elevated arm stress test (Roos test)
8. Hoover test
9. hyperabduction test (Wright)
10. Kemp test
11. Lindner test
12. Milgram test
13. Minor test
14. shoulder depression test
15. Soto Hall test
16. straight-leg raise test (Lasegue)
17. Valsalva test for spinal compression
18. vertebral artery test

### **B. Orthopedic tests: shoulder**

1. Apley scratch test
2. drop-arm test (Codman)
3. glenohumeral apprehension tests
4. (posterior and anterior)
5. Hawkins-Kennedy test
6. Lippman test
7. Neer test
8. Speed test
9. Yergason test

### **C. Orthopedic tests: wrist, hand, and elbow**

1. Cozen & reverse Cozen tests
2. Finkelstein test
3. Mill & reverse Mill tests
4. Phalen test
5. retinacular test
6. Tinel test (wrist, elbow)
7. valgus/varus stress test

### **D. Orthopedic tests: hip and pelvis**

1. Ely test
2. FABER (Patrick) test
3. Gaenslen test
4. Hibb test
5. Nachlas test
6. Ober test
7. Ortolani click test
8. pelvic rock test
9. telescoping test
10. Thomas test
11. Trendelenburg test
12. Yeoman test
13. piriformis test

### **E. Orthopedic tests: knee**

1. anterior/posterior drawer test
2. Apley compression test
3. Apley distraction test
4. bulge test
5. Lachman test
6. McMurray test
7. patellar apprehension test
8. patellar ballottement test
9. patellofemoral grind test
10. valgus/varus stress test

### **F. Orthopedic tests: ankle and foot**

1. anterior/posterior drawer test
2. dorsiflexion test
3. forefoot adduction test
4. metatarsal squeeze test (Morton)
5. talar tilt test
6. test for rigid or supple pes planus (flat feet)
7. gastrocnemius-soleus squeeze test (Thompson)
8. tibial torsion test

## **Types of Laboratory Tests and Diagnostic Imaging Studies**

### **A. Urine**

1. routine urinalysis
2. special tests

### **B. Hematology**

1. CBC
2. coagulation studies
3. blood typing
4. erythrocyte sedimentation rate

### **C. Serum Tests**

1. electrolytes
2. chemistry
3. hormones
4. therapeutic drug monitoring
5. antibody testing

### **D. Stool Analysis**

1. collection
2. gross analysis of stool
3. specialty tests

### **E. Microbiology**

1. technique
2. types

### **F. Pathology (including specimen collection)**

1. cytology
2. biopsy

### **G. Immunology**

1. autoimmune
2. infectious diseases
3. immunological response tests

### **H. Pulmonary Function**

1. tests
2. studies

### **I. Diagnostic Ultrasonography**

1. musculoskeletal system
2. vascular system
3. tissue/organ systems

### **J. Electrodiagnostic Tests**

1. cardiac system
2. musculoskeletal system
3. nervous system

### **K. Radiography**

1. orthopedic
2. tissue/organ systems

### **L. Other Imaging/Viewing Studies**

1. studies using radiation
2. nuclear medicine scanning tests
3. fiberoptic studies
4. magnetic resonance imaging (MRI)
5. angiography

### **M. Toxicology**

1. toxic metals
2. pesticides/herbicides/solvents
3. pharmacotherapeutic agents

### **N. Pregnancy and Neonatology**

1. pregnancy
2. neonatology
3. 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                        | Capsicum frutescens                           |
| Aconitum napellus                           | Cassia angustifolia<br>(Senna alexandrina)    |
| Actaea racemosa<br>(Cimicifuga racemosa)    | Caulophyllum thalictroides                    |
| Aesculus hippocastanum                      | Ceanothus americanus                          |
| Allium cepa                                 | Centella asiatica                             |
| Allium sativum                              | Chamaelirium luteum                           |
| Aloe vera                                   | Chelidonium majus                             |
| Althea officinalis<br>(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<br>(Commiphora molmol)      |
| Artemisia absinthium                        | Convallaria majalis                           |
| Artemisia vulgaris                          | Cordyceps sinensis                            |
| Asclepias tuberosa                          | Corydalis ambigua and spp.                    |
| Aspidosperma quebracho                      | Crataegus oxyacantha<br>(Crataegus laevigata) |
| Astragalus membranaceus                     | Curcuma longa                                 |
| Atropa belladonna                           | Cynara scolymus                               |
| Avena sativa                                | Datura stramonium                             |
| Bacopa monnieri                             | Digitalis purpurea                            |
| Baptisia tinctoria                          | Dioscorea villosa                             |
| Berberis aquifolium<br>(Mahonia aquifolium) | Echinacea angustifolia                        |
| Berberis vulgaris                           | Echinacea pallida                             |
| Boswellia serrata                           | Echinacea purpurea                            |
| Bryonia alba                                | Eleutherococcus senticosus                    |
| Bryonia cretica dioica                      | Ephedra sinica                                |
| Calendula officinalis                       | Equisetum arvense                             |
| Camellia sinensis                           | Eschscholzia californica                      |
| Cannabis sativa                             | Eucalyptus globulus                           |
| Capsella bursa-pastoris                     | 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  
allium cepa  
anacardium  
antimonium tartaricum  
apis mellifica  
arnica montana  
arsenicum album  
aurum metallicum  
baryta carbonica  
belladonna  
bryonia  
calcareo carbonica  
cantharis  
carbo vegetabilis  
causticum  
chamomilla  
cina  
cinchona officinalis (china)  
colocynthis  
conium  
drosera  
equisetum  
eupatorium perfoliatum  
euphrasia  
ferrum phosphoricum  
gelsemium  
glonoinum  
graphites  
hepar sulphuris  
hyoscyamus  
hypericum  
ignatia amara  
ipecacuanha  
kali bichromicum  
kali carbonicum  
lachesis  
ledum  
lycopodium  
magnesia phosphorica  
medorrhinum  
mercurius vivus  
natrum muriaticum  
natrum phosphoricum  
natrum sulphuricum  
nitricum acidum  
nux vomica  
phosphorus  
phytolacca  
platina  
podophyllum  
psorinum  
pulsatilla  
pyrogenium  
rhus toxicodendron  
rumex crispus  
ruta graveolens  
sanguinaria  
sepia  
silicea  
spongia tosta  
staphysagria  
stramonium  
sulphur  
symphytum  
syphilinum  
tabacum  
thuja occidentalis  
tuberculinum  
urtica urens  
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          |
| bupirone               | 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                    | salmeterol  |
| oxycodone                      | selenium sulfide                                      |
| oxymetazoline (nasal spray)    | sildenafil  |
| oxytocin (pitocin)             | sitagliptin   |
| paclitaxel                     | sodium phosphate enema                                |
| pembrolizumab                  | spironolactone  |
| penicillamine                  | sucrafate   |
| penicillin                     | sulfasalazine   |
| pentoxifylline                 | sumatriptan   |
| permethrin                     | tamoxifen   |
| phenazopyridine                | tamsulosin  |
| phenelzine                     | terbinafine   |
| phentermine                    | testosterone  |
| phenylephrine                  | tetanus (DTaP and Tdap) vaccines                      |
| phenytoin                      | tiotropium bromide                                    |
| pioglitazone                   | tofacitinib   |
| pneumococcal polyvalent        | tolterodine   |
| polio vaccine                  | trastuzumab   |
| potassium chloride             | trazodone   |
| PPD skin test                  | triamcinolone   |
| pramipexole                    | trimethoprim/sulfamethoxazole                         |
| prednisone                     | triple antibiotic (bacitracin, neomycin, polymyxin B) |
| pregabalin                     | USP thyroid   |
| pregnenolone                   | valacyclovir  |
| prochlorperazine               | valsartan   |
| progesterone (oral micronized) | varenicline   |
| propranolol                    | varicella vaccine                                     |
| propylthiouracil               | venlafaxine   |
| pseudoephedrine                | vinblastine   |
| raloxifene                     | warfarin  |
| RGE vaccine                    | zidovudine (AZT)                                      |
| rifampin                       | zoster vaccine  |
| risperidone                    | zolpidem  |
| rivastigmine                   |   |

NOTE: Although individual fluids (e.g., lactated Ringer's solution, 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 75-85 case clusters that will include a clinical summary of the case and four to six questions pertaining to that case. For example, the examinee 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 30-35% of the questions on the Part II - Core Clinical Science Examination will test the examinee's ability to diagnose common conditions (listed on pages 9-14 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 18-20% of the questions will test knowledge of Materia Medica (see list of botanical medicines beginning on page 17 and list of homeopathic medicines on page 20). Approximately 28-30% of the questions will test knowledge of other modalities applied using naturopathic principles, including clinical nutrition, physical medicine, and psychology. Approximately 20% of the questions will test 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 physician.

An examination can test only a sample of an examinee's knowledge. The sampling of items on an NPLEX examination is stratified, meaning that the examination 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 provide an idea of the types of questions the examinee should 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.

### Example Case #1

**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 dyspnea and sharp, stabbing chest pain that worsens when she breathes deeply or coughs.

**MEDICAL HISTORY:** LMP was 30 days ago. She has not been sexually active since her divorce earlier this year, but she continues to use oral contraceptives to treat dysmenorrhea and menorrhagia.

**PSYCHOSOCIAL:** She lives with her dog. She is a loan processor at a bank. As a result of the stress associated with the divorce, she has experienced increasingly frequent episodes of anxiety.

**HEALTH HABITS:** Her vegan diet consists primarily of whole foods, but recently she has developed cravings for simple carbohydrates. She drinks a glass of wine two or three evenings every week; she has never smoked cigarettes or used drugs recreationally. She usually walks her dog twice per day and 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) per day.

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

**MEDICATIONS:** loratadine for seasonal allergies; ethinyl estradiol/norgestimate, which she has used for 6 years

**ALLERGIES:** seasonal pollens and cat dander

**VITAL SIGNS:** Her temperature is 99.1°F (37.3°C), BP is 102/60 mmHg, HR is 96 bpm, RR is 18/min., and SpO<sub>2</sub> is 93%.

**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.

**PRELIMINARY LAB RESULTS:** Results of lab tests are pending.

**DIAGNOSTIC IMAGING:** Results of imaging studies are pending.

1. Given her presentation, which finding would most likely be evident on physical examination?
  - A. a negative Trendelenburg test
  - B. absence of a pleural friction rub
  - C. an abnormal ankle-brachial index
  - D. an elevated ankle blood pressure reading
2. The most likely diagnosis is \_\_\_\_\_, but you must also include \_\_\_\_\_ in the differential.
  - A. pulmonary embolism; atelectasis and gastrocnemius tear
  - B. pulmonary embolism; myocardial infarction and superficial thrombophlebitis
  - C. myocardial infarction; atelectasis and gastrocnemius tear
  - D. myocardial infarction; myocardial infarction and superficial thrombophlebitis
3. Which aspect of her clinical picture most likely predisposed her to this condition?
  - A. her use of loratadine
  - B. her recent onset of anxiety
  - C. her marathon training regimen
  - D. her long-term use of oral contraceptives

4. You activate EMS. While you await their arrival, which action is most important?
  - A. Start an IV line.
  - B. Administer oxygen.
  - C. Monitor her vital signs.
  - D. Apply heat packs to her calf.
  
5. EMS has still not arrived, and you determine that a homeopathic medicine would be appropriate adjunctive care. The pain in her chest is worse with any movement, and the calf pain is better when you gently palpate it. She has become increasingly irritable during the medical interview. Given the information in her case and these additional aspects of her clinical picture, which homeopathic medicine best fits her presentation?
  - A. bryonia
  - B. lycopodium
  - C. apis mellifica
  - D. arnica montana
  
6. Is a 4 oz tincture that contains *Crataegus oxyacantha*, *Ginkgo biloba*, *Viburnum prunifolium*, and *Tilia europaea*, to be taken bid, indicated to treat her condition at this time, and if not, why not?
  - A. Yes.
  - B. Maybe, but only if the results of a lipid panel are WNL.
  - C. No; the combination is indicated to treat vascular pain only.
  - D. No; the current condition requires emergency assessment and treatment.
  
7. After she has been treated and her condition has stabilized, she returns for a follow-up appointment. Which nutrient is indicated as part of her treatment plan?
  - A. vitamin K2MK4 5 mg po
  - B. citrus bioflavonoids 300 mg po
  - C. vitamin B<sub>6</sub> 100 mg and magnesium 500 mg IV
  - D. topical vitamin E 400 IU massaged into her calf
  
8. To prevent recurrence of her condition, the most important change she should make would be to:
  - A. regularly practice deep breathing exercises.
  - B. use a different medication to treat her gynecological symptoms.
  - C. eat a more balanced diet that includes animal protein and anti-inflammatory foods.
  - D. begin a more comprehensive stretching and warm-up routine whenever she exercises.

## Example Case # 2

**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 6 days, he has had only two bowel movements.

**MEDICAL HISTORY:** He has a 40-year history of constipation and was diagnosed with BPH 2 years ago. He gets up three or four times every night to urinate.

**PSYCHOSOCIAL:** He lives with his wife and new puppy. He recently retired from an accounting firm where he was employed for 45 years.

**HEALTH HABITS:** His omnivorous diet consists primarily of sandwiches and microwaveable meals. He drinks a cup of coffee at breakfast and a glass of red wine with dinner. He drinks 1 liter of water every day, mostly in the morning, but he does not drink any liquids after 5 p.m. in order to reduce the number of times he awakens to urinate at night. He does not have a regular exercise regimen, but he walks the puppy for 10 minutes five or six times per day.

**SUPPLEMENTS:** Serenoa repens 640 mg qd, and for the past 5 days Rhamnus purshiana and Podophyllum peltatum (1:1) 20 gtt bid

**MEDICATIONS:** none

**ALLERGIES:** none known

**FAMILY HISTORY:** His father died of a CVA 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, HR is 96 bpm, and RR is 18/min and shallow.

**PHYSICAL EXAMINATION:** His abdomen is slightly distended and tympanic to percussion. Palpation elicits LLQ guarding and tenderness to light pressure, and a small tender mass is evident in the 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 imaging studies are pending.

1. The most likely diagnosis is \_\_\_\_\_, but you must also include \_\_\_\_\_ in your differential.
  - A. bowel obstruction; diverticulitis and appendicitis
  - B. bowel obstruction; toxic megacolon and inflammatory bowel disease
  - C. diverticulitis; bowel obstruction and appendicitis
  - D. diverticulitis; toxic megacolon and inflammatory bowel disease
2. Which diagnostic procedure is most indicated to confirm the most likely diagnosis?
  - A. abdominal CT scan
  - B. colonoscopy with biopsy
  - C. abdominal ultrasonography
  - D. barium enema with radiograph

3. You recommend that he discontinue the botanical formula because:
  - A. it could aggravate the nocturia.
  - B. it could aggravate the pain in his abdomen.
  - C. given his family medical history, it would not be safe for him.
  - D. it might alleviate the nocturia, but it is unlikely to reduce the pain in his abdomen.
  
4. Is a prescription for *Ricinus communis* indicated at this time, and if so, how should it be administered?
  - A. No.
  - B. Yes; cold pack qd
  - C. Yes; warm pack qd
  - D. Maybe, but only if his liver function tests are WNL.
  
5. Which drugs are indicated to treat his condition?
  - A. prednisone and loperamide
  - B. loperamide and ciprofloxacin
  - C. ciprofloxacin and metronidazole
  - D. metronidazole and prednisone
  
6. Which dietary recommendation is indicated for him at this time?
  - 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 recovered from this episode, he returns for a follow-up appointment. Which supplements are indicated as part of his treatment plan?
  - A. niacin and potassium
  - B. L-arginine and calcium
  - C. pyridoxine and wheat germ
  - D. L-glutamine and ground flax seed

### Example Case #3

PATIENT: 8-year-old male

PRESENTATION: The patient's mother 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. His mother noticed that the day before, he was pale and had copious clear nasal discharge.

MEDICAL HISTORY: He is well-developed and was in good health at his well-child checkup a month ago.

ALLERGIES: none known

VITAL SIGNS: His mother says that his temperature is 101.5F (38.6C), HR is 120 bpm, and RR is 60/min.

1. To focus your diagnosis, which question is most important to ask his mother?
  - A. When he is coughing, does he vomit?
  - B. Is he holding his neck rigidly?
  - C. Is there a rash on his abdomen?
  - D. What is his breathing like when he is not coughing?
2. The most likely diagnosis is \_\_\_\_\_, but you must also include \_\_\_\_\_ in the 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 he was playing outside, he jumped off a swing at the wrong moment, tripped, and scraped his knee. He became extremely distraught and frightened, and his symptoms started soon after this event. Accidents and injuries frighten him because he has a fear of dying. Given the information in his case and these additional aspects of his clinical picture, 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. being wrapped in hot blankets
5. You recommend that he be brought to your clinic 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. According to 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 Case #4

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

**PRESENTATION:** The patient presents with left shoulder pain. Onset was 2 months ago. When she is at rest, the pain is a continuous, diffuse ache, but 10 days ago she noticed that use of her left arm and sleeping on her left side increased the severity of the pain. She has no history of trauma to her shoulder or any prior episodes of the pain.

**MEDICAL HISTORY:** Two years ago, she was diagnosed with hypothyroidism.

**PSYCHOSOCIAL:** She is single and lives with her dog. She is a writer.

**HEALTH HABITS:** Her omnivorous diet is high in simple carbohydrates such as bread and pasta. She does not drink alcohol or smoke cigarettes. She uses psilocybin occasionally. She spends 4 to 8 hours seated at her computer every day. She walks her dog for 15 minutes, two times per day. For the past month, she has been unable to hold his leash in her left hand.

**SUPPLEMENTS:** a daily multivitamin supplement

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

**ALLERGIES:** none known

**VITAL SIGNS:** Her temperature is 97.6F (36.4C), BP is 130/84 mmHg, HR is 80 bpm, and RR is 18/min.

**PHYSICAL EXAMINATION:** She is right hand dominant. Palpation elicits point tenderness deep to the anterior deltoid of her left shoulder. Active and passive ROM of her left shoulder girdle are moderately diminished in all directions. ROM of the cervical spine is within normal limits, and deep tendon reflexes are 2+ bilaterally. Valsalva test is negative. Cardiopulmonary auscultation and abdominal examination are unremarkable.

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

**DIAGNOSTIC IMAGING:** Imaging studies were not ordered at this appointment.

1. The PE suggests inflammation or injury to the \_\_\_\_\_, which would be confirmed by a positive \_\_\_\_\_.
  - A. biceps tendon; Neer test
  - B. biceps tendon; Speed test
  - C. glenohumeral capsule; Neer test
  - D. glenohumeral capsule; Speed test
2. The most likely diagnosis is \_\_\_\_\_, but you must also include \_\_\_\_\_ in your differential.
  - A. adhesive glenohumeral capsulitis; shoulder dislocation and thoracic outlet syndrome
  - B. adhesive glenohumeral capsulitis; bicipital tendonitis and partial thickness rotator cuff tear
  - C. bicipital tendinopathy; shoulder dislocation and thoracic outlet syndrome
  - D. bicipital tendinopathy; 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 tendinopathy; abduction and external rotation
  - B. bicipital tendinopathy; resisted flexion and supination of the arm
  - C. adhesive capsulitis; resisted flexion and supination of the arm
  - D. adhesive capsulitis; adduction and pronation of the arm

4. She receives in-office hydrotherapy, and you provide her with recommendations for home treatment. Which botanical medicine is indicated to treat her condition, and why?
  - A. *Avena sativa*, for its analgesic effect
  - B. *Curcuma longa*, for its anti-inflammatory effect
  - C. *Piscidia erythrina*, for its anti-inflammatory effect
  - D. *Harpagophytum procumbens*, for its analgesic effect
  
5. A prescription of \_\_\_\_\_ is indicated because it will \_\_\_\_\_.
  - A. glucosamine; increase IL-6
  - B. glucosamine; reduce inflammation
  - C. bromelain; increase IL-6
  - D. bromelain; reduce inflammation
  
6. She returns for a follow-up appointment 2 weeks later. Is an exercise regimen indicated at this time, and if so, what would you recommend?
  - A. No; exercise is contraindicated at this stage in her recovery.
  - B. Yes; shoulder ROM exercises
  - C. Yes; isometric shoulder exercises
  - D. Yes; overhead exercises with light free weights
  
7. Six weeks later, her symptoms have significantly improved. You determine that she would benefit from naturopathic manipulative therapy to the affected shoulder to prevent recurrence, but first you must make sure that she does not have \_\_\_\_\_.
  - A. scoliosis
  - B. breast implants
  - C. an osteolytic bone lesion
  - D. a history of autoimmune (Hashimoto) thyroiditis
  
8. If her symptoms return, which diagnostic study should be done?
  - A. MRI
  - B. radiography
  - C. ultrasonography
  - D. a nerve conduction study



### Example Case #5

**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. She noticed the lesions 1 week ago, and during this time they have not changed.

**MEDICAL HISTORY:** She has always been in good health, and she has had all scheduled vaccinations.

**PSYCHOSOCIAL:** She lives with her parents and two kittens who were adopted 1 week ago. She is in the 5th grade.

**HEALTH HABITS:** She refuses to eat most vegetables, although she loves fruit, chicken, and pasta. 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), HR is 100 bpm, and RR is 22/min.

**PHYSICAL EXAMINATION:** Lymphadenopathy is not evident, but two 2.5 cm erythematous annular plaques are visible on her right upper arm; they are not painful to palpation. The advancing borders of the lesions are slightly raised and scaling, and a few pinpoint pustules are present around the edge. No other similar lesions are evident, although she has a few small excoriations around her wrist. PE is otherwise unremarkable.

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

**DIAGNOSTIC IMAGING:** Imaging studies were not ordered at this appointment.

1. The most likely diagnosis is \_\_\_\_\_, but you must also include \_\_\_\_\_ in the differential.
  - A. impetigo; pemphigus and scabies
  - B. impetigo; contact dermatitis and varicella
  - C. tinea corporis; impetigo and insect bites
  - D. tinea corporis; pityriasis rosea and varicella
2. To determine the cause of her symptoms, you collect a skin scraping. What needs to be done to prepare the specimen for evaluation?
  - A. Use a Gram stain process.
  - B. Apply 10% KOH to the specimen.
  - C. Fix the specimen in formaldehyde.
  - D. Culture the specimen on blood agar.
3. What do you expect the specimen to show?
  - A. mites
  - B. hyphae
  - C. hemolytic colonies
  - D. hyperproliferation of epidermal cells
4. Which drug is indicated to treat her condition?
  - A. acyclovir
  - B. penicillin
  - C. terbinafine
  - D. doxycycline

5. Her father says he does not want her to take any drugs. Which botanical medicine will have a similar action to the indicated drug?
- A. *Passiflora incarnata* po
  - B. *Selenicereus grandiflorus* po
  - C. topical *Melaleuca alternifolia*
  - D. topical *Podophyllum peltatum*

**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 to treat her condition.
  - B. it would be safe for her, but it is not indicated to treat her condition.
  - C. although it is indicated to treat her condition, it would not be safe for a patient of her age.
  - D. it would not be safe for her, and it is not indicated to treat her condition.
7. The lesions itch and burn intensely after she bathes in hot water and when she is in bed. 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 aspects of her clinical picture, which homeopathic medicine best fits her presentation?
- A. sulphur
  - B. pulsatilla
  - C. chamomilla
  - D. calcarea carbonica

### Example Case #6

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

**PRESENTATION:** Four weeks after a three-month 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 episodes of chills, followed by fever, headache, and diaphoresis. The episodes occur in the afternoon and last several hours, after which he feels better. Before he left for his trip, he received all recommended vaccinations and took a prophylactic antimalarial drug. While he was traveling, he noticed several insect bites on his forearms, but he says these quickly resolved on their own.

**MEDICAL HISTORY:** He had varicella and strep pharyngitis infections when he was a child.

**PSYCHOSOCIAL:** He lives alone and is not in a long-term relationship. He graduated from university 1 month ago and is currently looking for a job in hotel management.

**HEALTH HABITS:** His omnivorous diet includes fresh organic fruits and vegetables, and he enjoys preparing the Cuban foods he ate while growing up. When he is in a hurry, he skips meals and eats protein bars. He drinks coffee in the mornings. While he attended university, his alcohol consumption was sometimes excessive, but now he drinks only one or two bottles of beer with his friends on weekends. Occasionally he has unprotected sex. He typically uses the elliptical and weight machines at a gym for 1 hour, three times per week, but since he returned home, he has had less energy for exercise.

**SUPPLEMENTS:** He takes sublingual vitamin B<sub>12</sub> before he exercises.

**MEDICATIONS:** loratadine prn

**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, HR is 88 bpm, and RR is 12/min.

**PHYSICAL EXAMINATION:** He appears lethargic, and his hands are diaphoretic. Palpation elicits 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 <sup>6</sup> /μL | 4.6 - 6.2 x 10 <sup>6</sup> /μL | 4.2 x 10 <sup>12</sup> /L | 4.6 - 6.2 x 10 <sup>12</sup> /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 under oil immersion magnification (1000x) show oval-shaped erythrocytes containing trophozoites with Schüffner dots and schizonts, indicating infection with *Plasmodium ovale*.

Chemistry panel is WNL.

Urine is dark in color. Urinalysis is WNL.

HIV testing is negative.

**DIAGNOSTIC IMAGING:** Imaging studies were not ordered at this appointment.

1. The most likely diagnosis is gastroenteritis caused by *Plasmodium ovale*, and the results of his urinalysis are indicative of \_\_\_\_\_.
  - A. precipitated urates in an acid urine
  - B. dehydration subsequent to watery stools
  - C. an abnormal concentration of urine during episodes of high fever
  - D. free hemoglobin produced by hemolysis, and possible renal failure

2. He prefers to treat his condition naturopathically, without the use of drugs. You prescribe a botanical and a homeopathic medicine. Which botanical medicine is indicated to treat his condition, and for which action?
  - A. *Artemisia annua*; antiparasitic
  - B. *Artemisia annua*; immune system support
  - C. *Artemisia absinthium*; antiparasitic
  - D. *Artemisia absinthium*; immune system support
  
3. For the past few weeks, he has had an aversion to being touched. This morning, a neighborhood cat rubbed against his legs; the sensation disturbed him and he felt frightened, which bothered him because the cat has always been friendly and he loves animals. Given the information in his case and these additional aspects of his clinical picture, which homeopathic medicine best fits his presentation?
  - A. *nux vomica*
  - B. *podophyllum*
  - C. *china officinalis*
  - D. *arsenicum album*
  
4. One week later, he returns to your clinic and tells you that because his symptoms have not resolved, he is willing to add a drug to his treatment plan. Which drug is indicated to treat his infection?
  - A. isoniazid
  - B. mebendazole
  - C. metronidazole
  - D. hydroxychloroquine

### 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 while he is having an episode of palpitations, dyspnea, and mild chest pain. Onset of the episodes was 2 months ago. During these episodes, he becomes diaphoretic, he develops an occipital headache, and his heart beats faster.

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

**PSYCHOSOCIAL:** He lives with his girlfriend. He works as a computer programmer, and he volunteers as a youth mentor every Saturday. He has an active social life.

**HEALTH HABITS:** His vegetarian diet is well balanced. On weekends, he drinks two or three bottles of beer. He does not smoke cigarettes; he smokes cannabis occasionally. He jogs 3 miles (5 km), 3 days per week.

**SUPPLEMENTS:** a daily multivitamin supplement, CoQ<sub>10</sub> 100 mg qd, fish oil 3 g qd

**MEDICATIONS:** lisinopril 20 mg qd, amlodipine 10 mg qd

**ALLERGIES:** cat dander, ragweed

**FAMILY HISTORY:** unremarkable

**VITAL SIGNS:** His temperature is 98.9°F (37.2°C), BP is 150/100 mmHg, HR is 110 bpm, and RR 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. Auscultation reveals 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 – 5.0 IU/mL | 1.2 mIU/L  | 0.5 – 5.0 mIU/L |
| glucose (fasting) | 105 mg/dL  | < 100 mg/dL     | 5.8 mmol/L | < 5.6 mmol/L    |

#### DIAGNOSTIC IMAGING:

Imaging studies were not ordered at this appointment.

1. Which diagnostic procedure is indicated to establish the most likely diagnosis?
  - A. A serum aldosterone test and CRP would be used to diagnose cardiomyopathy.
  - B. A serum aldosterone test and CRP would be used to diagnose pheochromocytoma.
  - C. 24-hour urine catecholamine and metanephrine tests would be used to diagnose cardiomyopathy.
  - D. 24-hour urine catecholamine and metanephrine tests would be used to diagnose pheochromocytoma.
2. During the physical examination, he develops a sudden, severe headache and mild dyspnea, and he becomes very anxious. His BP is now 196/122 mmHg. You assess \_\_\_\_\_, and the most appropriate action is to \_\_\_\_\_.
  - A. hypertension stage I; administer intravenous D5W, then arrange for his girlfriend to drive him to the ED
  - B. hypertension stage II; activate EMS for immediate transport to the ED
  - C. hypertensive urgency; administer intravenous D5W, then arrange for his girlfriend to 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 weak pulse. Are chest compressions indicated at this time, and if so, where should you place your hands?
  - A. No.
  - B. Maybe, but only if he becomes apneic.
  - C. Yes; over the upper half of his sternum
  - D. Yes; over the lower half of his sternum
  
4. EMS arrives and he is transported to the ED. Which drug is indicated to address his acute presentation?
  - A. aspirin
  - B. atenolol
  - C. amlodipine
  - D. amiodarone
  
5. His acute condition is treated, and he returns to your clinic 2 months later for adjunctive care of his chronic hypertension. You prescribe a botanical medicine and provide him with dietary recommendations. He says that now he feels energetic enough to resume his exercise regimen. Is exercise safe for him at this time, and if so, which initial exercise plan is indicated?
  - A. No; it would not be safe for him to resume his exercise regimen at this time.
  - B. Maybe, but a stress ECG should be done first, and the results must be WNL.
  - C. Yes; he should begin with stretching and strengthening exercises.
  - D. Yes; he should begin with 10 minutes of walking at a moderate pace and increase the duration by 5 minutes every day until he is walking for 60 minutes per day.

### **Example Case #8**

**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 cough. His symptoms began yesterday evening with a mild sore throat, but they had worsened by the morning.

**MEDICAL HISTORY:** He has been in good health except for an occasional URI. Two months ago, he had an adverse reaction to his most recent routine vaccinations, and his parents have not continued with the immunization schedule.

**PSYCHOSOCIAL:** He lives with his parents and his 2-year-old sister. He attends preschool and has many friends.

**HEALTH HABITS:** His family's omnivorous diet includes fresh fruits and vegetables with each meal. He is not a picky eater and likes most vegetables. He plays outside every day and participates in a preschool soccer program every Sunday afternoon.

**SUPPLEMENTS:** none

**MEDICATIONS:** none

**ALLERGIES:** penicillins

**FAMILY HISTORY:** unremarkable

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

**PHYSICAL EXAMINATION:** He is pale and listless, and he has marked halitosis. When you ask him questions, he hesitates to answer; when he does speak, his voice is hoarse. Bilateral submandibular lymphadenopathy is evident on palpation. His pharyngeal mucosa is erythematous, and his tonsils are covered by an adherent grey pseudomembrane. Auscultation reveals soft expiratory wheezing, but no stridor or use of accessory muscles for breathing are evident.

**PRELIMINARY LAB RESULTS:** Results of lab tests are pending.

**DIAGNOSTIC IMAGING:** Imaging studies were not ordered at this appointment.

1. Can a diagnosis of diphtheria be made based on the PE findings alone, and if not, which result will confirm the diagnosis?
  - A. Yes.
  - B. No; positive biopsy of the pseudomembrane
  - C. No; Gram stain of nasopharyngeal and pharyngeal samples that shows club-shaped bacilli
  - D. No; lateral radiograph of the neck that shows an enlarged epiglottis protruding from the anterior wall of the hypopharynx (thumb sign)
2. His mother asks if you can prescribe a homeopathic medicine that would provide rapid relief. You take his homeopathic case and learn that when he swallows, he winces in pain. Since he became ill, he has been easily irritated when someone interrupts whatever he is doing. Given the information in his case and these additional aspects of his clinical picture, 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, too high a dosage could \_\_\_\_\_.
  - A. Curcuma longa; cause a rash
  - B. Curcuma longa; exacerbate the malaise
  - C. Lomatium dissectum; cause a rash
  - D. Lomatium dissectum; exacerbate the malaise
  
4. His mother uses steam inhalations as a home treatment when he or his sister contract uncomplicated URIs. Are steam inhalation treatments indicated to treat his current condition, and why or why not?
  - A. Yes; steam inhalation would help loosen his bronchial congestion.
  - B. Yes, but treatments should not last longer than 15 seconds to avoid fluid accumulation in his lungs.
  - C. Yes; steam inhalation would relax the smooth muscle of his respiratory passages and suppress his cough.
  - D. No; steam inhalation is not indicated for the treatment of diphtheria.
  
5. His sister is currently asymptomatic, and she has had all her scheduled immunizations. What is the standard of care to prevent transmission of the infection to her?
  - A. She should receive prophylactic antibiotics.
  - B. The patient should be hospitalized and quarantined throughout the acute course of his illness.
  - C. Her parents should observe her closely, and at the first signs of illness, she should be scheduled for an appointment.
  - D. No special precautions are required, as she is up-to-date on her vaccinations.
  
6. His parents tell you that since he has contracted diphtheria, they believe he does not need to receive the rest of the scheduled diphtheria booster vaccinations. You tell them that:
  - A. he should be vaccinated, as the illness does not confer immunity.
  - B. he does not need additional vaccinations for diphtheria, as the illness has conferred immunity.
  - C. he does not need additional 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. he does not need additional 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. Are the parents at risk of contracting diphtheria, and if not, why not?
  - A. Yes, they can expect to be infected and because they are adults, they are likely to experience severe illness.
  - B. Maybe; if it has been more than 10 years since their last Tdap vaccination, they should receive a booster.
  - C. No; diphtheria causes symptoms only in children.
  - D. No, and at this point, it is too late for a vaccination to protect them from infection.



**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, fatigue, and heavy, squeezing chest pain. Onset was 2 days ago. Her symptoms are worse with exertion and improve with rest; she does not experience dyspnea. She thinks she might have food poisoning because she has not felt well since she ate in a restaurant 2 nights ago.

**MEDICAL HISTORY:** At her last appointment 5 years ago, her BP was 142/92 mmHg; she chose to treat her borderline hypertension with lifestyle modifications. Because of her busy schedule, she has not seen a healthcare provider since then.

**PSYCHOSOCIAL:** She lives with her wife and two cats. She is a landscape architect and works 40 to 50 hours every week.

**HEALTH HABITS:** Her omnivorous diet consists primarily of organic meats, whole grains, and fresh fruits and vegetables. She does not drink alcohol, smoke cigarettes, or use drugs recreationally. Her work requires a moderate degree of physical activity and she does not have time for additional exercise. For the past 5 days, she has been walking longer distances than usual at the job site.

**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, HR is 90 bpm, and RR is 16/min.

**PHYSICAL EXAMINATION:** Her skin is cool and clammy. Neurological examination is unremarkable. Peripheral edema is not evident and her lungs are clear. On cardiac auscultation, a grade II/VI systolic murmur is audible, and a soft S4 is heard over the apex.

**PRELIMINARY LAB RESULTS:**

| TEST                | U.S. VALUE | U.S. RANGE  | IU VALUE    | IU RANGE     |
|---------------------|------------|-------------|-------------|--------------|
| cholesterol (total) | 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:**

Imaging studies were not ordered at this appointment.

1. The most likely diagnosis is \_\_\_\_\_ but you must also include \_\_\_\_\_ in the 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. You activate EMS and she is transported to the ED. The most appropriate 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

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

3. You activate EMS and she is transported to the ED. If an ECG showed \_\_\_\_\_, it would indicate that she has \_\_\_\_\_.
  - A. premature beats; myocardial ischemia
  - B. wide QRS complex; a 2<sup>nd</sup> degree heart block
  - C. prolonged PR interval; a 3<sup>rd</sup> degree heart block
  - D. elevated ST segments; myocardial ischemia
  
4. Which drug is indicated to treat her acute condition?
  - A. aspirin
  - B. atropine
  - C. acetaminophen
  - D. hydrochlorothiazide
  
5. She is released from the hospital and calls you the next day. Her symptoms have remitted except for a single episode of chest pain that awakened her at 1:00 a.m. She got up and drank hot tea, which relieved the pain. Given the information in her case and these additional aspects of her clinical picture, which homeopathic medicine best fits her presentation?
  - A. phosphorus
  - B. arnica montana
  - C. arsenicum album
  - D. aconitum napellus

**Example Case #10**

**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 with rectal bleeding.

**PSYCHOSOCIAL:** He lives with his parents and two older siblings. He attends preschool.

**HEALTH HABITS:** He dislikes many foods and prefers to eat pizza, macaroni and cheese, and breakfast cereals with added sugar. He likes to play outside, and he just learned 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, HR is 106 bpm, and RR is 18/min.

**PHYSICAL EXAMINATION:** On auscultation, bowel sounds are diminished, and a high-pitched "ping" sound is audible to the right of the umbilicus. Palpation of this region reveals a tender sausage-shaped mass.

**PRELIMINARY LAB RESULTS:** CBC and urinalysis are WNL.

**DIAGNOSTIC IMAGING:** Results of imaging studies are pending.

1. The most likely diagnosis is \_\_\_\_\_, but you must also include \_\_\_\_\_ in the 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 definitively diagnose his condition?
  - A. PET scan
  - B. endoscopy
  - C. flexible sigmoidoscopy
  - D. radionuclide imaging
3. He feels better when he lies down in a fetal position with a heating pad pressed to his abdomen. Given the information in his case and this additional aspect of his clinical picture, which homeopathic medicine best fits his presentation?
  - A. colocynthis
  - B. lycopodium
  - C. nux vomica
  - D. staphysagria

4. Is a prescription for a botanical tincture indicated to help prevent esophageal irritation caused by vomiting, and if so, which one?
  - A. No; botanical medicine is contraindicated because he should not receive anything by mouth.
  - B. Yes; aloe vera gel, for its anti-inflammatory effect
  - C. Yes; Zingiber officinale tincture, for its anti-nausea effect
  - D. Yes; Mentha piperita infusion, for its antispasmodic effect

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

5. Is Aloe vera indicated to treat his condition, and if so, what part of the plant should be used?
  - A. Yes; the gel, for its vulnerary effect
  - B. Yes; the leaf, for its anti-inflammatory effect
  - C. Maybe; the root will provide a laxative effect, but it should be used only if his electrolyte levels are WNL.
  - D. No; Aloe vera in any form is contraindicated for him.
6. Is a physiotherapeutic modality indicated to treat his condition, and if so, which one?
  - A. Yes; high-volt galvanism
  - B. Yes; Ricinus communis warm packs
  - C. Yes; visceral manipulation of the descending colon
  - D. No; he should be referred to a pediatric surgeon.

### **Example Case #11**

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

**PRESENTATION:** The patient presents for general wellness counseling.

**MEDICAL HISTORY:** G4P2, SAB1, TAB1. When she was 13 years old, her uncle sexually abused her, and she became pregnant. When she told her parents about the abuse, they did not believe her and sent her to live with an aunt for the duration of her pregnancy; they insisted that she relinquish the baby for adoption. Four weeks after her son was adopted, she began to use cannabis, and two years later she began to use cocaine and heroin. She has alternated between abstinence and heavy use and has participated in numerous court-ordered group-therapy sessions for substance use disorder. She describes these sessions as unhelpful and stopped using drugs on her own 2 years ago, after she joined a church community.

**PSYCHOSOCIAL:** She lives alone. Her younger son's grandmother, who is the mother of her ex-boyfriend, has custody of the child, with whom she has supervised visitations every week. She has no contact with her older son because the adoption was closed. She is a hairdresser and changes jobs when the work environment becomes too negative; she is currently unemployed. She did not complete secondary school but takes classes at night to complete an equivalency diploma. She has had many best friends, but she ended these relationships because her friends did not treat her well. She attends church services and prayer meetings four nights every week, but her past history of betrayals by friends has made her hesitant to befriend other congregants. She has seen multiple healthcare providers and discontinues care after two or three sessions because she believes they do not understand or care about her. Chart notes obtained from her previous providers describe her behavior as alternately flirtatious and argumentative.

**HEALTH HABITS:** Her omnivorous diet consists primarily of whole foods. Every 2 months, she uses a detoxification or liver-cleanse product that requires fasting. She does not drink alcohol or smoke cigarettes; she has not used cocaine, heroin, or cannabis for 2 years. She alternates between periods of intense daily exercise at a gym and periods of complete inactivity. She has changed gyms numerous times to avoid people who are friendly when interacting with her but who gossip about her when she is not present.

**SUPPLEMENTS:** a liver support formula qd; every 2 months she follows a self-prescribed detoxification protocol that includes the use of laxatives, probiotics, multivitamins, protein drinks, and EFAs.

**MEDICATIONS:** none

**ALLERGIES:** none known

**FAMILY HISTORY:** unremarkable

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

**PHYSICAL EXAMINATION:** She is dressed in close-fitting exercise clothing, brightly colored jewelry, and expensive-appearing athletic shoes; her makeup is heavily applied. She laughs and cries as she recounts her history, and she frequently touches you. When she speaks about her friends and former healthcare providers, she raises her voice, but then she calms herself and behaves as if she is mischievously confiding a secret to a friend. PE is unremarkable.

**PRELIMINARY LAB RESULTS:**

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

**DIAGNOSTIC IMAGING:**

Imaging studies were not ordered at this appointment.

1. In addition to the traumatic experiences of her adolescence, which aspects of her history suggest that she has a personality disorder, and which disorder do you most suspect?
  - A. her history of recreational drug dependency; narcissistic
  - B. her ambivalence about accepting help from healthcare professionals; narcissistic
  - C. her flamboyant personal style and high-conflict interactions with others; histrionic
  - D. her history of unstable relationships and fear of abandonment; histrionic
  
2. Should you refer her to a psychiatrist, and if so, which class of medication is most indicated?
  - A. No; counseling is the most appropriate initial treatment.
  - B. Maybe, but she should receive cognitive behavioral therapy as well as medication.
  - C. Yes; antipsychotic medication will be necessary to address her disorder.
  - D. Yes; mood-stabilizing medication will be necessary to address her disorder.
  
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 three 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. Explain that the symptom is temporary and 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 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. Recognize this as a manipulative plea for attention and reassure her that she will feel better in a few days. Teach her some stress-management techniques.
  - B. Inform her 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. Recognize this as a plea for attention, as no real harm can come from taking the herbs and supplements that she has in her home. Refer her to a counselor and urge her to make an appointment within the next week so that you are not legally liable if she does attempt to end her life by suicide.
  
5. You realize that although her condition is not an anxiety disorder, anxiety is a contributing factor to her clinical picture. Research has shown that which lifestyle change can reduce anxiety, cause the release of endogenous opioids, and enhance immune function?
  - A. eating a raw-foods diet
  - B. sleeping 9 to 10 hours per night
  - C. beginning an aerobic exercise regimen
  - D. beginning systematic desensitization therapy

**Example Research Item** (a standalone item unrelated to the previous cases)

You have prescribed *Hydrangea arborescens* for patients who have urolithiases, and their conditions have all improved with this treatment. The most recent issue of the *New Zealand Journal of Botanical Medicine* included a randomized, controlled clinical trial on the effect of *Hydrangea arborescens* in the treatment of urolithiases. Results are  $t(1, 28) = 2.50, p = 0.06$ . What does this mean, and how should you use the information?

- A. *H. arborescens* will be effective for 94% of patients who have urolithiases, and you can prescribe it for patients who have this condition with the expectation that it will benefit them.
- 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, and you can prescribe it for patients who have urolithiases with the expectation that it will benefit them.
- C. Because this study was reported in a peer-reviewed journal, you can assume that *H. arborescens* is not effective in the treatment of urolithiases, and you should not expect it to help patients who have this condition.
- 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, and you should 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. B | 3. D | 4. B | 5. A | 6. D | 7. B | 8. B |
| Case #2:       | 1. C | 2. A | 3. B | 4. C | 5. C | 6. C | 7. D |      |
| Case #3:       | 1. D | 2. D | 3. C | 4. A | 5. D |      |      |      |
| Case #4:       | 1. B | 2. D | 3. B | 4. B | 5. D | 6. B | 7. C | 8. A |
| Case #5:       | 1. C | 2. B | 3. B | 4. C | 5. C | 6. A | 7. A |      |
| Case #6:       | 1. B | 2. A | 3. C | 4. D |      |      |      |      |
| Case #7:       | 1. D | 2. D | 3. A | 4. B | 5. C |      |      |      |
| Case #8:       | 1. C | 2. D | 3. C | 4. A | 5. A | 6. A | 7. B |      |
| Case #9:       | 1. C | 2. C | 3. D | 4. A | 5. C |      |      |      |
| Case #10:      | 1. C | 2. D | 3. A | 4. A | 5. D | 6. D |      |      |
| Case #11:      | 1. C | 2. B | 3. C | 4. C | 5. C |      |      |      |
| 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 the examinee's knowledge of diagnosis, *Materia Medica*, other treatment modalities, and medical interventions. To pass the examination, examinees must be able to demonstrate concurrent<sup>2</sup> competence in four *general* exam areas<sup>3</sup>: *Diagnosis, Materia Medica, Other Modalities*, and *Medical Interventions*.

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

**Comprehensive Mastery** of the NPLEX Part II - Core Clinical Science Examination is indicated on the report of exam results with either a "P" (pass) or "F" (fail) designation.

Passing the NPLEX Part II – Core Clinical Science Examination requires that the examinee achieve a "P" (pass) in all four *general* exam areas (as indicated by the competencies listed on pages 5-8).

The **Diagnosis** graphic reflects the examinee's performance on the exam items related to physical and clinical diagnostic methods, and lab tests and imaging studies.

The **Materia Medica** graphic reflects the examinee's performance on the exam items related to botanical medicine and homeopathy.

The **Other Modalities** graphic reflects the examinee's performance on the exam items related to nutrition, physical medicine, and psychology.

The **Medical Interventions** graphic reflects the examinee's performance on the exam items related to emergency medicine and pharmacology.

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<sup>2</sup> 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. The examinee must pass all four general exam areas in the same exam administration.

<sup>3</sup> The examinee has passed the Part II - Core Clinical Science Examination after having correctly answered at least the minimum number of items that NPLEX subject matter experts (licensed/registered NDs) have determined are required to demonstrate competence in each of the four *general* exam areas. To determine the passing standards NPLEX uses a modified Angoff cut score 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. The NABNE website or the most up-to-date copy of the *NABNE Part II Examinee Handbook* has information regarding which jurisdictions require passage of any or all 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 the EPE 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.

Examinees should consider taking the EPE when the CCSE is taken if they 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 the ability to pass both examinations. If the jurisdiction in which the examinee is practicing passes legislation granting prescribing rights to NDs (with subsequent requirement of the EPE), the examinee may not need to study for an examination again.

If the examinee is planning to practice in a jurisdiction that currently grants prescribing rights but does not require passage of the EPE, it is still a good idea to be 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 the examinee 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 an examinee wants to be able to provide parenteral services to patients, taking the PMEE to test knowledge of the practice is recommended.

**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:

- I. **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.
  - A. Take a medical and psychosocial history and interpret findings.
  - B. Perform a physical examination and interpret findings.
  - C. Recognize the signs and symptoms of the condition and characteristics of a typical lesion.
  - D. Make a diagnosis and generate a differential diagnosis.
  - E. Delineate the pathogenesis of conditions and determine possible etiologies.
  - F. Collect and prepare specimens for lab evaluation, select necessary lab tests, and interpret results.
  - G. Identify relevant risk factors.
  - H. Determine the prognosis and potential sequelae.
  - I. Identify high risk patients and know when referral is necessary.
  
- II. **TREATMENT SELECTION:** Treat common conditions using the most appropriate therapeutic interventions.
  - A. Identify the indications for and contraindications to biopsy of superficial skin lesions.
  - B. Identify the indications for and contraindications to excision and removal of superficial skin lesions.
  - C. Identify the indications for and contraindications to incision and drainage of superficial skin lesions.
  - D. Identify the indications for and contraindications to cryosurgery of superficial skin lesions.
  - E. Identify the indications for and contraindications to chemical cautery or electrocautery of superficial skin lesions.
  - F. Identify the indications for and contraindications to electrodesiccation (with or without curettage) of superficial skin lesions.
  - G. Identify the indications for and contraindications to lift-and-snip of superficial skin lesions.
  - H. Identify the indications for and contraindications to nail trephination, removal, and ablation.
  - I. Identify treatment options for traumatic wound care and laceration repair.
  - J. Know topical, injectable, or oral treatments for skin conditions.
  - K. Know other treatment options for skin lesions that would be performed upon referral to specialty practitioners.
  - L. Ensure patient safety by identifying patient characteristics that would influence selection of treatment and procedures.

**IV. PROCEDURES Apply principles for safe performance of minor surgical procedures to patient care.**

- A. Identify common infectious agents, understand the infective process, and treat infections that result from breach of the dermal barrier.
- B. Apply the principles of pre-operative procedures and site preparation (including pre-operative instructions to patients).
- C. Apply the principles of anesthesia selection and administration, including different types of injectable, topical, and cryo-anesthetics.
- D. Select the most appropriate instruments and materials required for minor surgical procedures.
- E. 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.
- F. Apply principles of hemostasis, including patient positioning, choice of anesthesia, topical hemostatic agents, and electrocautery.
- G. Apply the principles of wound care, including irrigation and debridement.
- H. Apply the principles of wound closure, including selection of sutures, tissue adhesives, staples, tapes, and appropriate application techniques.
- I. Manage complications that arise during surgical procedures.
- J. Employ precautionary methods to protect the practitioner from infection and injury.

**V. POSTOPERATIVE CARE: Manage postoperative patient care.**

- A. Provide appropriate postoperative instructions to patients.
- B. Communicate appropriate postoperative care procedures.
- C. Apply the principles of postoperative pain management.
- D. Identify and treat postoperative complications.
- E. Provide appropriate monitoring and followup.

**Conditions**

- A. **Pustular Lesions** (14%)  
abscess, carbuncle, furuncle
- B. **Cystic Formations** (14%)  
cysts (dermoid, epidermoid, sebaceous, ganglion, trichilemmal), milia
- C. **Skin Lesions** (33%)  
acrochordon, actinic keratosis, cherry hemangioma, cutaneous horn, keratoacanthoma, lentigine, molluscum contagiosum, nevus, pyogenic granuloma, sebaceous hyperplasia, seborrheic keratosis, telangiectasia, verruca
- D. **Nail Conditions** (14%)  
felon, ingrown nail, paronychia, subungual hematoma
- E. **Anal and Genital Conditions** (5%)  
anal fistula, condylomata acuminata, pilonidal cyst
- F. **Masses and Neoplasms** (14%)  
basal cell carcinoma, dermatofibroma, lipoma, melanoma, squamous cell carcinoma
- G. **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 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 discrete palpable nodule
2. Which procedure is indicated 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 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 after the procedure 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. Is anesthesia indicated for this procedure, and if so, which anesthetic is indicated?
  - A. No, anesthesia is not required for this procedure.
  - B. Yes; 1% lidocaine with epinephrine
  - C. Yes; 2% procaine without epinephrine
  - D. Yes; 0.5% bupivacaine with epinephrine
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 postoperative 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 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. To enable confirmation of the diagnosis, which procedure is indicated?
  - A. cryosurgery
  - B. shave biopsy
  - C. electrodesiccation
  - D. chemical cauterization
3. Which anesthetic is generally safe during the first trimester of pregnancy?
  - A. lidocaine without epinephrine
  - B. lidocaine with epinephrine
  - C. bupivacaine without epinephrine
  - D. bupivacaine with epinephrine
4. Adding 8.4% sodium bicarbonate to the anesthetic will \_\_\_\_\_.
  - A. reduce the pain of the injection
  - B. decrease bleeding by vasoconstrictive action
  - C. increase the numbing effect of the anesthetic
  - D. increase clearance of the anesthetic by the liver

## **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   4. 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:

- I. **PRINCIPLES: Understand the principles of pharmaceutical prescribing.**
  - A. Know indications for prescription of drugs.
  - B. Understand the mechanisms of action of drug classes and of specific drugs.
  - C. Know the principles of pharmacodynamics and pharmacokinetics.
  
- II. **PATIENT SAFETY: Evaluate drug prescriptions for patient safety.**
  - A. Know contraindications for drugs.
  - B. Know common and/or critical adverse effects of drugs.
  - C. Identify factors that affect drug toxicity.
  - D. Know potential drug-drug interactions (including the OTC drugs at the end of the drug list).
  - E. Be able to perform physical assessments and/or know appropriate lab tests to monitor drug efficacy and assess drug toxicity.
  
- III. **PRESCRIBING: Provide appropriate and effective patient care.**
  - A. Diagnose conditions and select drug prescriptions to address those conditions.
  - B. Instruct patients on appropriate use and administration of prescription drugs.
  - C. Know appropriate dosing procedures (e.g., indicated routes of administration, principles of titrating and tapering, adjusting dosages in response to monitoring results, etc.).
  - D. Know multidrug protocols for common conditions (e.g., diabetes, CAD, etc.).
  - E. Identify and manage polypharmacy issues.
  - F. Identify and manage opportunities for deprescribing.
  - G. Recognize characteristics of drug-seeking behavior.
  - H. Demonstrate knowledge of the abuse potential of prescription and recreational 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.
  - I. Identify conditions and treatments most appropriately managed by referral to a specialist.

## **ELECTIVE PHARMACOLOGY DRUG CATEGORIES & WEIGHTINGS**

- A. Drugs acting on the cardiovascular system (8-10%)**
- B. Drugs acting on the endocrine system (8-10%)**
- C. Drugs acting on the blood and lymph system (3-4%)**
- D. Drugs acting on the dermatologic system (3-4%)**
- E. Drugs used to treat disorders of the eye, ear, and nose (2-3%)**
- F. Drugs acting on the gastrointestinal/hepatic system (6-8%)**
- G. Drugs acting on the genitourinary system (4-6%)**
- H. Drugs acting on the musculoskeletal system (3-4%)**
- I. Drugs acting on the nervous system (7-9%)**
- J. Drugs acting on the respiratory system (4-5%)**
- K. Drugs used to treat psychological and cognitive disorders (7-9%)**
- L. Drugs used to manage pain, drug addiction, and drug overdose (7-9%)**
- M. Drugs used as antimicrobials; vaccines (10-12%)**
- N. Drugs used for chemotherapy and immunosuppression (8-9%)**
- O. 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                 | calcipotriol (calcipotriene) |
| acetylcysteine                 | calcitonin                   |
| acyclovir                      | canagliflozin                |
| adalimumab                     | cannabis                     |
| albendazole                    | carvedilol                   |
| albuterol (salbutamol)-inhaled | cefdinir                     |
| alendronate                    | ceftriaxone                  |
| allopurinol                    | cefuroxime                   |
| alprazolam                     | celecoxib                    |
| alprostadil                    | cephalexin                   |
| amantadine                     | cholera vaccine              |
| amiodarone                     | ciprofloxacin                |
| amitriptyline                  | cisplatin                    |
| amlodipine                     | clarithromycin               |
| amoxicillin                    | clindamycin                  |
| amoxicillin/clavulanate        | clobetasol propionate        |
| ampicillin                     | clomiphene                   |
| anastrozole                    | clonidine                    |
| aripiprazole                   | clopidogrel                  |
| atenolol                       | clozapine                    |
| atomoxetine                    | cocaine                      |
| atorvastatin                   | codeine                      |
| azithromycin                   | colchicine                   |
| baclofen                       | colesevelam                  |
| beclomethasone                 | cromolyn sodium-nebulized    |
| benzonatate                    | cyclobenzaprine              |
| benztropine                    | cyclophosphamide             |
| bethanechol                    | cyclosporine                 |
| bicalutamide                   | cyclosporine-ophthalmic      |
| botulinum toxin                | dabigatran                   |
| bromocriptine                  | denosumab                    |
| budesonide-oral                | desmopressin                 |
| bupivacaine                    | dexamethasone                |
| buprenorphine                  | dextroamphetamine            |
| bupropion                      | DHEA                         |
| buspiron                       | diazepam                     |

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

|                       |  |
|-----------------------|--|
| tamsulosin            | tretinoin (topical)                    |
| Tdap and DTaP vaccine | triamcinolone                          |
| terazosin             | triamterene                            |
| terbinafine           | trimethoprim/sulfamethoxazole          |
| testosterone          | ursodeoxycholic acid (ursodiol)        |
| thalidomide           | valacyclovir                           |
| thyroid, USP          | valproate (divalproex)                 |
| timolol               | vancomycin                             |
| tiotropium            | varenicline                            |
| tizanidine            | varicella vaccine and zoster vaccine   |
| tofacitinib           | venlafaxine                            |
| tolterodine           | verapamil                              |
| topiramate            | warfarin                               |
| tramadol              | zidovudine (azidothymidine)            |
| trastuzumab           | zolpidem                               |
| trazodone             | zoster vaccine recombinant, adjuvanted |

### **Over-the-Counter (OTC) Drugs**

The following OTC drugs might 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 are “standalone” items: they will not be presented in the context of a case.

**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 has 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 first-line drug treatment is indicated 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.

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

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

### **I. DIAGNOSIS: Diagnose Zang-Fu syndromes (see 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. History taking 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 and 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 (significant illnesses and procedures, family history and genetic conditions, 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 Fluids, 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, Jiagian/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 treatment modality other than needling; know indications and contraindications for and use of moxibustion, cupping, gua sha, and electroacupuncture.**

**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.

**C. Electroacupuncture**

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

**D. Acupressure**

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

**E. 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 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 nonmedical 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

- A. **Lung** (10-15%)
  - 1. Empty: Qi Deficiency, Yin Deficiency, Dryness
  - 2. Full Exterior: Wind-Cold Invasion, Wind-Heat Invasion, Wind-Water Invasion (a.k.a. Wind-Damp Invasion)
  - 3. Full Interior: Heat, Damp-Phlegm, Cold-Phlegm, Phlegm-Heat, Dry-Phlegm, Phlegm Fluid Obstruction
- B. **Large Intestine** (5-10%)
  - 1. Full: Damp-Heat, Heat, Heat Obstruction, Cold Invasion, Qi Stagnation
  - 2. Empty: Dryness, Cold, Collapse
- C. **Stomach** (5-10%)
  - 1. Empty: Qi Deficiency, Yin Deficiency
  - 2. Full: Qi Stagnation, Fire (or Phlegm-Fire), Cold Invasion, Stomach Qi Rebellling Upward, Damp-Heat, Food Retention, Blood Stasis
- D. **Spleen** (5-10%)
  - 1. Empty: Qi Deficiency, Yang Deficiency, Qi Sinking, Spleen not Controlling Blood, Blood Deficiency
  - 2. Full: Cold-Damp Invasion, Damp-Heat Invasion
- E. **Heart** (10-15%)
  - 1. Empty: Qi Deficiency, Yang Deficiency, Yang Collapse, Blood Deficiency, Yin Deficiency
  - 2. Full: Fire Blazing, Phlegm-Fire Harassing the Heart, Phlegm Misting the Mind, Qi Stagnation, Vessel Obstruction
  - 3. Empty/Full: Blood Stasis
- F. **Small Intestine** (5-10%)
  - 1. Empty: Deficiency and Cold
  - 2. Full: Full-Heat, Qi Pain, Qi Tied (Qi Obstruction)
- G. **Bladder** (5-10%)
  - 1. Empty: Deficiency and Cold (Kidney Yang Deficiency)
  - 2. Full: Damp-Heat, Damp-Cold
- H. **Kidney** (10-15%)
  - 1. Empty: Yang Deficiency, Yin Deficiency, Qi not Firm, Failing to Receive Qi, Essence Deficiency
  - 2. Empty/Full: Yin Deficiency with Empty-Heat Blazing
- I. **Pericardium** (0-5%)
  - 1. Full: Heat, Qi Stagnation, Blood Stasis
- J. **Gallbladder** (5-10%)
  - 1. Empty: Qi Deficiency
  - 2. Full: Damp-Heat, Dampness
- K. **Liver** (10-15%)
  - 1. Empty: Blood Deficiency, Yin Deficiency
  - 2. Full: Qi Stagnation, Qi Rebellling, Blood Stasis, Fire Blazing, Damp-Heat, Cold Stagnation
  - 3. Full/Empty: Yang Rising, Wind Agitation

### 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 full-time parent and continues to breastfeed the youngest child. Her menses have resumed and are regular, but the flow is now scanty. She sleeps well at night, and she does not experience 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. Essence Deficiency
2. Her fatigue and decreased appetite indicate a disorder of the \_\_\_\_\_.
  - A. Spleen
  - B. Stomach
  - C. Small Intestine
  - D. Large Intestine
3. 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 and tonify Qi
4. To address her clinical picture, which points are indicated for needling?
  - 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
5. 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 principle(s) is (are) indicated for his condition?
  - A. tonify Lung Qi
  - B. tonify Spleen Qi
  - C. tonify Kidney Yin
  - D. dissolve Phlegm, and 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. BL 20, BL 21, CV 12, SP 6, ST 36
  - D. GV 20, LI 4, LU 5, ST 8, ST 40

## **Answers to Acupuncture Example Items**

Case #1:    1. C   2. A   3. A   4. B   5. C  
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 administering parenteral medicine as part of a naturopathic practice should be able to demonstrate knowledge in the following competencies:

I. **GENERAL PRINCIPLES** (17-19%)

A. **Know and apply the general principles of parenteral medicine to patient care, including:**

1. fluid and electrolyte balance
2. pH, acid-base balance
3. osmolality, osmolarity, and tonicity
4. water solubility vs. fat solubility
5. flow (drip) rate
6. pharmacodynamics/kinetics
7. first and second-pass metabolism and phase I & II detoxification pathways

II. **PATIENT ASSESSMENT** (19-21%)

A. **Evaluate whether parenteral medicine is indicated, contraindicated, or must be used with caution for patients in the following populations:**

1. pediatric patients
2. adult patients
3. geriatric patients
4. special populations (pregnant and lactating patients, patients who have G6PD, MTHFR or other polymorphisms, etc.)

B. **Evaluate whether parenteral therapy is indicated, contraindicated, or must be used with caution for an individual patient, based on:**

1. patient history, presentation, and working diagnosis
2. physical examination and vital signs
3. lab tests, including:
  - a. kidney, liver, and cardiac function
  - b. nutritional assessment
  - c. testing for special risks (polymorphisms, etc.)

C. **Assess the patient to evaluate appropriateness of parenteral therapy prior to administering each treatment.**

D. **Recognize the indications for referral to a specialist for continuation of care or to urgent care prior to administering a treatment.**



### III. TREATMENT SELECTION (16-18%)

#### A. Select and know how to parenterally administer therapeutic agents, including:

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

8. other
  - a. heparin
  - b. hydrochloric acid (HCl)
  - c. hydrogen peroxide
  - d. methylene blue

**B. Determine appropriate parameters of prescription.**

1. dosage of drugs/nutrients
2. frequency of treatment

**C. Provide post-treatment instructions to patients.**

**D. Recognize adverse effects of treatment observed in clinical presentation and lab test results and modify treatment plan accordingly.**

**E. Evaluate effectiveness of treatment observed in clinical presentation and lab test results and modify treatment plan accordingly.**

**F. Select adjunctive nutrition and lifestyle practices that complement parenteral therapy.**

**G. Demonstrate ability to clearly communicate with other healthcare providers in the co-management of patients.**

**IV. PROCEDURES AND TECHNIQUES (16-18%)**

**A. Know standard protocols for maintaining a cleanroom.**

**B. Formulate safe and effective infusible solutions.**

1. Identify appropriately certified and legally compliant compounding pharmacies.
2. Verify that the agents used are of appropriate identity, strength, quality, purity, and consistency according to U.S and/or Canadian regulatory standards.
3. Select appropriate carrier solutions.
4. Recognize contraindications to combining certain therapeutic substances.
5. Know how to minimize particulates in in-office compounded infusible solutions.
6. Know how to accurately label in-office compounded infusible solutions.
7. Know appropriate protocols for substance storage and stale-dating.

**C. Select appropriate equipment for each mode of administration:**

1. injections (IM, SubQ, intradermal, etc.)
2. IV pushes
3. IV drips

**D. Know how to safely and correctly administer treatments via injection, IV push, and IV drip, using principles of:**

1. sterile technique
2. vein/site selection
3. site preparation
4. injection technique (using syringe & needle)
5. insertion technique (butterfly, angiocatheter, etc.)
6. port or PICC access
7. flow (drip) rate
8. IV line patency

**E. Evaluate patient tolerance of treatment by monitoring:**

1. vital signs
2. systemic signs and symptoms during and immediately after infusion (hypoglycemia, allergic reaction, arrhythmia, cardiac arrest, etc.)
3. insertion site reactions during and immediately after infusion (infiltration, extravasation, etc.)

**V. SAFETY (19-21%)**

**A. Apply principles of patient risk assessment based on medical history, clinical presentation, mental status, lab values, medications, and disease progression or regression.**

**B. Recognize and know how to address complications of parenteral treatment, including:**

1. local (phlebitis, local infection, etc.)
2. systemic (septicemia, embolism, etc.)
3. interactions with other nutrients and drugs the patient is taking

**C. Know how to respond to events requiring first aid or emergency protocols using:**

1. emergency medications (epinephrine HCl, diphenhydramine chloride, calcium gluconate/chloride, glucagon, etc.)
2. oxygen administration
3. CPR, BCLS
4. emergency equipment (pulse oximeter, AED, etc.)

**D. Know how to apply universal precautions required in treatment setting, including equipment disposal measures.**

**E. Know when and how to deploy practitioner safety measures required in the treatment setting (use of PPE, prevention of needle sticks, etc.)**

**F. Know standard protocols for appropriate facility cleaning.**

## VI. ETHICAL AND LEGAL CONSIDERATIONS (7-9%)

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

### **Conditions**

- A. **dehydration**
- B. **nutrient deficiencies** (iron deficiency anemia, etc.)
- C. **digestive compromise** (IBS, IBD, autoimmune gluten-sensitive enteropathy, post-GI surgery, etc.)
- D. **hepatic and pancreatic impairment**
- E. **acute infections** (pneumonia, influenza, COVID-19, etc.)
- F. **chronic infections** (Lyme disease, MRSA, HPV, herpes, hepatitis, etc.)
- G. **immune compromise** (HIV, autoimmune, etc.)
- H. **chronic health conditions** (CFS/ME, peripheral neuropathy, fibromyalgia, post-COVID syndrome, etc.)
- I. **adjunctive care for cancer, adverse effects of cancer treatment**
- J. **wellness support** (immune boosts, performance enhancement, sports recovery, etc.)
- K. **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**

Item #1: C

Item #2: C

Item #3: A

Item #4: D

## ACRONYMS & ABBREVIATIONS THE EXAMINEE IS EXPECTED TO KNOW

In addition to basic standard nomenclature (e.g., CO<sub>2</sub>, HCl), examinees are expected to know what the following abbreviations mean.

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

|       |  |         |   |
|-------|--|---------|---|
| EMS   | emergency medical services/<br>electronic muscle stimulation | IM      | intramuscular                                     |
| EOM   | extraocular movements  | INR     | international normalized ratio                    |
| EPA   | eicosapentaenoic acid  | IR      | infrared  |
| EPI   | epinephrine  | ITP     | immune thrombocytopenia                           |
| EPMS  | extrapyramidal motor system                                  | IU      | international units                               |
| EPO   | erythropoietin   | IUD     | intrauterine device                               |
| ESR   | erythrocyte sedimentation rate                               | IV      | intravenous                                       |
| ETOH  | ethyl alcohol  | IVP     | intravenous pyelogram                             |
| FBAO  | foreign body airway obstruction                              | IVU     | intravenous urogram                               |
| FEV   | forced expiratory volume                                     | JVD     | jugular venous distension                         |
| FOS   | fructooligosaccharide  | KOH     | potassium hydroxide                               |
| FSH   | follicle-stimulating hormone                                 | KUB     | kidney-ureter-bladder                             |
| FTI   | free thyroxine index   | LCIS    | lobular carcinoma in situ                         |
| FVC   | forced vital capacity  | LDH     | lactate dehydrogenase                             |
| G6PD  | glucose-6-phosphate-dehydrogenase                            | LDL     | low density lipoprotein                           |
| G#P#  | gravida para (pregnancies/live births)                       | LFT     | liver function tests                              |
| GABA  | gamma-aminobutyric acid                                      | LGBTQ+  | lesbian/gay/bisexual/transgender/<br>questioning+ |
| GALT  | gut-associated lymphoid tissue                               | LH      | luteinizing hormone                               |
| GC    | gonorrhea/gonococcus   | LLQ     | left lower quadrant                               |
| GCS   | Glasgow Coma Scale   | LoC     | level of consciousness                            |
| GDM   | gestational diabetes mellitus                                | LOC     | loss of consciousness                             |
| GERD  | gastroesophageal reflux disease                              | LUQ     | left upper quadrant                               |
| GFR   | glomerular filtration rate                                   | LMP     | last menstrual period                             |
| GGT   | gamma-glutamyl transferase                                   | LP(a)   | lipoprotein (a)                                   |
| GI    | gastrointestinal   | MAOI    | monoamine oxidase inhibitor                       |
| GnRH  | gonadotropin-releasing hormone                               | MCH     | mean corpuscular hemoglobin                       |
| GU    | genitourinary  | MCHC    | mean corpuscular hemoglobin<br>concentration      |
| HA    | headache   | MCV     | mean corpuscular volume                           |
| HAV   | hepatitis A virus  | MI      | myocardial infarction                             |
| HbA1c | glycosylated hemoglobin                                      | MMPI    | Minnesota Multiphasic Personality<br>Inventory    |
| HBV   | hepatitis B virus  | MMR     | measles, mumps, and rubella vaccine               |
| hCG   | human chorionic gonadotropin                                 | MMSE    | mini mental state exam                            |
| hct   | hematocrit   | MPV     | mean platelet volume                              |
| hgb   | hemoglobin   | MRA     | magnetic resonance angiography                    |
| HCV   | hepatitis C virus  | MRI     | magnetic resonance imaging                        |
| HDL   | high density lipoprotein                                     | MRSA    | methicillin-resistant Staph aureus                |
| HEENT | head, eyes, ears, nose, throat                               | MS      | multiple sclerosis                                |
| HIV   | human immunodeficiency virus                                 | MSM     | methylsulfonylmethane                             |
| HLA   | human leukocyte antigen                                      | MVA/MVC | motor vehicle accident/collision                  |
| HPA   | hypothalamic-pituitary-adrenal (axis)                        | NAC     | N-acetyl cysteine                                 |
| HPV   | human papillomavirus   | NIDDM   | non-insulin dependent diabetes mellitus           |
| HRT   | hormone replacement therapy                                  | NKDA    | no known drug allergy                             |
| HSV   | herpes simplex virus   | npo     | nil per os (nothing by mouth)                     |
| HTN   | hypertension   | NS      | normal saline (or non significant)                |
| HUS   | hemolytic uremic syndrome                                    | NSAID   | non-steroidal anti-inflammatory drug              |
| IBD   | inflammatory bowel disease                                   | O2 sat  | oxygen saturation                                 |
| IBS   | irritable bowel syndrome                                     | OA      | osteoarthritis                                    |
| IDDM  | insulin dependent diabetes mellitus                          | OC      | oral contraceptive                                |
| IgA   | immunoglobulin A   | OTC     | over-the-counter                                  |
| IgD   | immunoglobulin D   | O&P     | ova and parasites                                 |
| IgE   | immunoglobulin E   | PABA    | para-aminobenzoic acid                            |
| IgG   | immunoglobulin G   |         |   |
| IgM   | immunoglobulin M   |         |   |



|           |  |         |   |
|-----------|--|---------|---|
| PAC       | premature atrial contractions                            | SA      | sinoatrial node   |
| Pap       | Papanicolaou (test for cervical pathology)               | SAB     | spontaneous abortion  |
| PAT       | paroxysmal atrial tachycardia                            | SAD     | standard (North) American diet (omnivorous and refined-food diet) |
| PCR       | polymerase chain reaction                                | SAMe    | S-adenosyl methionine   |
| PE        | physical examination                                     | sl      | sublingual/sublingually   |
| PERRLA    | pupils equal, round, reactive to light and accommodation | SLE     | systemic lupus erythematosus                                      |
| PET       | positive emission tomography                             | SOB     | shortness of breath   |
| PCOD/PCOS | polycystic ovary disease                                 | SOD     | superoxide dismutase  |
| PDW       | platelet distribution width                              | SPECT   | single photon emission CT   |
| PFT       | pulmonary function tests                                 | SSRI    | selective serotonin re-uptake inhibitor                           |
| PID       | pelvic inflammatory disease                              | stat    | statim (immediately)  |
| PIP/DIP   | proximal/distal interphalangeal joints                   | STI/STD | sexually transmitted infection                                    |
| PKU       | phenylketonuria  | sTSH    | sensitive thyroid-stimulating hormone                             |
| PMI       | point of maximal impulse                                 | SQ/SubQ | subcutaneous  |
| PMN       | polymorphonuclear lymphocyte                             | T3      | triiodothyronine  |
| PMS       | premenstrual syndrome                                    | T4      | thyroxine   |
| prn       | pro re nata (as needed)                                  | TAB     | therapeutic abortion  |
| PSA       | prostate specific antigen                                | TB      | tuberculosis  |
| PSVT      | paroxysmal supraventricular tachycardia                  | TENS    | trans electrical nerve stimulation                                |
| PT        | prothrombin time   | TIA     | transient ischemic attack   |
| PTSD      | post traumatic stress disorder                           | TIBC    | total iron binding capacity                                       |
| PTT       | partial thromboplastin time                              | TKO     | to keep open (IV)   |
| PUFA      | polyunsaturated fatty acids                              | TMD     | temporomandibular disorder  |
| PVC       | premature ventricular contractions                       | TPN     | total parenteral nutrition  |
| RA        | rheumatoid arthritis                                     | TPO     | thyroid peroxidase  |
| RAI       | radioactive iodine (uptake test)                         | TRH     | thyroid-releasing hormone   |
| RAST      | radio allergen sorbent test                              | TSH     | thyroid-stimulating hormone                                       |
| RBC       | red blood cells  | UA      | urinalysis  |
| RDA       | recommended daily allowance                              | URI     | upper respiratory infection                                       |
| RDW       | red cell distribution width                              | USP     | United States Pharmacopeia  |
| RF        | rheumatoid factor  | UTI     | urinary tract infection   |
| Rh        | rhesus factor  | UV      | ultraviolet (including UVA, UVB, UVC)                             |
| RICE      | rest, ice, compression, elevation                        | VDRL    | venereal disease research laboratory test                         |
| RLQ       | right lower quadrant                                     | VLDL    | very low density lipoprotein                                      |
| ROM       | range of motion  | VMA     | vanillylmandelic acid   |
| RPR       | rapid plasma reagin                                      | VO2     | (ventilatory) oxygen consumption                                  |
| RRR       | regular rate and rhythm                                  | VRSA    | vancomycin-resistant Staph aureus                                 |
| RSV       | respiratory syncytial virus                              | WBC     | white blood cell  |
| RUQ       | right upper quadrant                                     | 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. Review the exam test blueprint content weightings.**

Understanding the exam blueprint content weightings for the exam competencies will help you to allocate your study time accordingly.

### **3. Budget additional study time for the content areas that are most difficult for you.**

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.

### **4. Familiarize yourself with the test format and procedures.**

All of the questions on the exam reflect a multiple-choice format with one best answer and three incorrect responses (i.e., distractors). To increase your comfort and confidence in taking multiple-choice tests, 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.

### **5. Expect the examinations to be challenging.**

NPLEX examinations are developed to require that you be able to synthesize and apply the knowledge you have gained over the years of naturopathic medical school. The examinations are developed in accordance with national testing standards. NPLEX trains item writers in the principles of writing reliable and valid items that are clearly worded. Every item is reviewed and edited by at least nine subject-matter expert NDs to ensure that it is as straightforward and concise as possible.

### **6. Approach the exam study 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 burdensome 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, which will allow 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.

After you have familiarized yourself with the competencies and topics that will be covered on the examination, the next step is to review the examples of case clusters and note how they are formatted. For the CCSE, the Minor Surgery Elective, the Parenteral Elective, and the Acupuncture Elective, the questions relate to a clinical summary. Questions on the Pharmacology Elective are all standalone questions. All questions on the NPLEX examinations are posed in a multiple-choice format with one correct answer and three incorrect answers (i.e., distractors).

In preparing to take the NPLEX, there is no quick substitute for years of study. Cramming the night before the examination will probably not improve your score. It is more important to relax and get a good night's sleep. Expect to have some anxiety before you take the examinations; as long as it is not excessive, it can help improve your mental alertness.

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

- First, the response option bubbles must be filled in **darkly** and **completely**. If a mark is too light or only partially fills the bubble, the optical scanner might read the item as unanswered and you will not be given credit for your response. If you erase a response, be sure to remove it completely. If there is still a mark in the response option bubble, the optical scanner might be unable to interpret which mark you intended, and you will not receive credit for any answer for that item.
- 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 marked 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**. After the exam period has ended, you will not be allowed to transfer answers to the answer sheet.

When responding to questions on the NPLEX Part II - Clinical Science Examinations, you will be required to use your clinical judgement. Select the **best** answer from the response options, based solely on the information given in the clinical presentation. Clinical summaries are written to represent the most common presentation of the condition. Try to not overthink your answer; usually your first impulse will be the best. Select the response alternative that will be true in **most** cases.

Item writers and editors have made every effort to present items in a straightforward manner. There are no "trick" questions on the examinations. When you encounter an item for which you do not know the answer, 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 the remaining

choices. Try not to spend too much time deliberating over one question. Some of the items will be very challenging. You are not expected to be able to answer every question correctly. In most cases, you need to answer only 60-70% of the items correctly in order to pass.

Remember to 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 of the examination. **If you choose to skip an item, be sure you skip the corresponding line on your answer sheet.** Because 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. 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, including Puerto Rico, and Canada. Before an item is used on an examination, it is reviewed by at least nine NDs for accuracy, relevance, and appropriateness. The examinations are edited for medical accuracy and clarity by professional editors. After proofreading 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 method for establishing scoring benchmarks) is used to establish this passing score. As part of the Angoff method, 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 or scoring benchmark 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). The 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. First, the exam answer sheets are scanned by an optical scanner using the latest technology. Next, reports and statistics are calculated without reference to any individual’s scores. Then, 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 for each specific exam area reviews these items to verify that the keyed answer is correct and that there is only one correct answer. The items are reviewed for clarity. The Exam Chair submits recommendations to the PTA Committee, who then makes the final decision regarding the 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 followed to ensure that the items on which examinees’ results are based are appropriate and fair.

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