

Examination Content Blueprint

Overview

The material on NCCPA’s certification and recertification exams can be organized in two dimensions:

- (1) organ systems and the diseases, disorders and medical assessments physician assistants encounter within those systems; and
- (2) the knowledge and skills physician assistants should exhibit when confronted with those diseases, disorders and assessments.

Please note that while the subject matter covered on the certification and recertification exams is the same, there is some difference in the *nature* of the questions on those exams. Generally, the questions on the initial certification exam are more specific, while questions on the recertification exam tend to address broader clinical issues. This difference is most apparent in the questions related to applying basic science concepts and reflects the different functions of the two exams.

The tables below illustrate the approximate percentage of exam questions you’ll encounter in several categories, grouped as described above. Other content dimensions cross-sect those categories delineated in the tables. For example, up to 20 percent of the questions on any exam may be related to surgery, and up to two percent may cover legal or ethical issues.

% of Content	Diseases, Disorders & Medical Assessments of the:
16%	Cardiovascular System
5%	Dermatologic System
9%	Eyes, Ears, Nose & Throat
6%	Endocrine System
10%	Gastrointestinal System/Nutrition
6%	Genitourinary System
3%	Hematologic System
3%	Infectious Diseases
10%	Musculoskeletal System
6%	Neurologic System
6%	Psychiatry/Behavioral
12%	Pulmonary
8%	Reproductive System

% of Content	Knowledge & Skill Areas:
16%	History Taking and Performing Physical Examinations
14%	Using Laboratory & Diagnostic Studies
18%	Formulating Most Likely Diagnosis
10%	Health Maintenance
14%	Clinical Intervention
18%	Pharmaceutical Therapeutics
10%	Applying Basic Science Concepts

Each question you encounter will address a disease, disorder or medical assessment from a category in the table at left *and* a knowledge or cognitive skill area from the table above.

On the following pages, we have provided lists of specific diseases, disorders, medical assessments, and knowledge areas you may encounter on your exam. Though these lists are not exhaustive, they can provide a foundation for your exam preparation. They serve as your blueprint to the exam content.

Diseases, Disorders and Medical Assessments by Organ System

Cardiovascular System

Cardiomyopathy

- Dilated
- Hypertrophic
- Restrictive

Conduction Disorders

- Atrial fibrillation/flutter
- Atrioventricular block
- Bundle branch block
- Paroxysmal supraventricular tachycardia
- Premature beats
- Sick sinus syndrome
- Ventricular tachycardia
- Ventricular fibrillation
- Torsades de pointes

Congenital Heart Disease

- Atrial septal defect
- Coarctation of aorta
- Patent ductus arteriosus
- Tetralogy of Fallot
- Ventricular septal defect

Heart Failure

Hypertension

- Essential
- Secondary
- Hypertensive emergencies

Hypotension

- Cardiogenic shock
- Orthostatic hypotension

Coronary Heart Disease

- Acute myocardial infarction
 - Non-ST segment elevation
 - ST segment
- Angina pectoris
 - Stable
 - Unstable
 - Prinzmetal variant

Vascular Disease

- Aortic aneurysm/dissection
- Arterial embolism/thrombosis
- Giant cell arteritis
- Peripheral arterial disease
- Phlebitis/thrombophlebitis
- Varicose veins
- Venous insufficiency
- Venous thrombosis

Valvular Disease

- Aortic stenosis
- Aortic regurgitation
- Mitral stenosis
- Mitral regurgitation
- Mitral valve prolapse
- Tricuspid stenosis
- Tricuspid regurgitation
- Pulmonary stenosis
- Pulmonary regurgitation

Other Forms of Heart Disease

- Acute and subacute bacterial endocarditis
- Acute pericarditis
- Cardiac tamponade
- Pericardial effusion

The Dermatologic System

Eczematous Eruptions

- Dermatitis
- Dyshidrosis
- Lichen simplex chronicus

Papulosquamous Diseases

- Drug eruptions
- Lichen planus
- Pityriasis rosea
- Psoriasis

Desquamation

- Erythema multiforme
- Stevens-Johnson syndrome
- Toxic epidermal necrolysis

Vesicular Bullae

- Bullous pemphigoid

Acneiform Lesions

- Acne vulgaris
- Rosacea

Verrucous Lesions

- Actinic keratosis
- Seborrheic keratosis

Insects/Parasites

- Lice
- Scabies
- Spider bites

Neoplasms

- Basal cell carcinoma
- Kaposi sarcoma
- Melanoma
- Squamous cell carcinoma

Hair and Nails

- Alopecia
- Onychomycosis
- Paronychia

Viral Diseases

- Condyloma acuminatum
- Exanthems
- Herpes simplex
- Molluscum contagiosum
- Varicella-zoster virus infections
- Verrucae

Bacterial Infections

- Cellulitis
- Erysipelas
- Impetigo

Fungal Infections

- Candidiasis
- Dermatophyte infections

Other

- Acanthosis nigricans
- Burns
- Hidradenitis suppurativa
- Lipomas/epithelial inclusion cysts
- Melasma
- Pilonidal disease
- Pressure ulcers
- Urticaria
- Vitiligo

EENT (Eyes, Ears, Nose, and Throat)

Eye Disorders

- Blepharitis
- Blowout fracture
- Cataract
- Chalazion
- Conjunctivitis
- Corneal abrasion
- Corneal ulcer
- Dacryocystitis
- Ectropion
- Entropion
- Foreign body
- Glaucoma
- Hordeolum
- Hyphema
- Macular degeneration
- Nystagmus
- Optic neuritis
- Orbital cellulitis
- Papilledema
- Pterygium
- Retinal detachment
- Retinal vascular occlusion
- Retinopathy
- Strabismus

Ear Disorders

- Acute/chronic otitis media
- Acoustic neuroma
- Barotrauma
- Cholesteatoma
- Dysfunction of eustachian tube
- Foreign body
- Hearing impairment
- Hematoma of external ear
- Labyrinthitis
- Mastoiditis
- Meniere disease
- Otitis externa
- Tinnitus
- Tympanic membrane perforation
- Vertigo

Nose/Sinus Disorders

- Acute/chronic sinusitis
- Allergic rhinitis
- Epistaxis
- Foreign body
- Nasal polyps

Mouth/Throat Disorders

- Acute pharyngitis
- Aphthous ulcers
- Diseases of the teeth/gums
- Epiglottitis
- Laryngitis
- Oral candidiasis
- Oral herpes simplex
- Oral leukoplakia
- Peritonsillar abscess
- Parotitis
- Sialadenitis

Benign and malignant neoplasms

The Endocrine System

Diseases of the Thyroid Gland

- Hyperparathyroidism
- Hypoparathyroidism
- Hyperthyroidism
- Hypothyroidism
- Neoplastic disease
- Thyroiditis

Diseases of the Adrenal Glands

- Corticoadrenal insufficiency
- Cushing syndrome
- Neoplastic disease

Diseases of the Pituitary Gland

- Acromegaly/gigantism
- Diabetes insipidus
- Dwarfism
- Neoplastic disease
- Pituitary adenoma

Diabetes Mellitus

- Type 1
- Type 2

Lipid Disorders

- Hypercholesterolemia
- Hypertriglyceridemia

The Gastrointestinal System/Nutrition

Esophagus

- Esophagitis
- Motility disorders
- Mallory-Weiss tear
- Neoplasms
- Strictures
- Varices

Stomach

- Gastroesophageal reflux disease
- Gastritis
- Neoplasms
- Peptic ulcer disease
- Pyloric stenosis

Gallbladder

- Acute/chronic cholecystitis
- Cholangitis
- Cholelithiasis

Liver

- Acute/chronic hepatitis
- Cirrhosis
- Neoplasms

Pancreas

- Acute/chronic pancreatitis
- Neoplasms

Small Intestine/Colon

- Appendicitis
- Celiac disease
- Constipation
- Diverticular disease
- Inflammatory bowel disease
- Intussusception
- Irritable bowel syndrome
- Ischemic bowel disease
- Lactose intolerance
- Neoplasms
- Obstruction
- Polyps
- Toxic megacolon

Rectum

- Anal fissure
- Abscess/fistula
- Fecal impaction
- Hemorrhoids
- Neoplasms

Hernia

Infectious and Non-infections Diarrhea

Vitamin and Nutritional Deficiencies

Metabolic Disorders

- Phenylketonuria

The Genitourinary System

GU Tract Conditions

- Benign prostatic hyperplasia
- Congenital abnormalities
- Cryptorchidism
- Erectile dysfunction
- Hydrocele/varicocele
- Incontinence
- Nephro/urolithiasis
- Paraphimosis/phimosis
- Testicular torsion

Infectious/Inflammatory Conditions

- Cystitis
- Epididymitis
- Orchitis
- Prostatitis
- Pyelonephritis
- Urethritis

Neoplastic Diseases

- Bladder carcinoma
- Prostate carcinoma
- Renal cell carcinoma
- Testicular carcinoma
- Wilms tumor

Renal Diseases

- Acute renal failure
- Chronic kidney disease
- Glomerulonephritis
- Hydronephrosis
- Nephrotic syndrome
- Polycystic kidney disease
- Renal vascular disease

Fluid and Electrolyte Disorders

- Hypervolemia
- Hypovolemia

Acid/Base Disorders

The Hematologic System

Anemias

- Anemia of chronic disease
- Aplastic anemia
- Folate deficiency
- G6PD deficiency
- Hemolytic anemia
- Iron deficiency
- Sickle cell anemia
- Thalassemia
- Vitamin B₁₂ deficiency

Coagulation Disorders

- Clotting factor disorders
- Hypercoagulable states
- Thrombocytopenia
 - Idiopathic thrombocytopenic purpura
 - Thrombotic thrombocytopenic purpura

Malignancies

- Acute/chronic lymphocytic leukemia
- Acute/chronic myelogenous leukemia
- Lymphoma
- Multiple myeloma

Infectious Diseases

Fungal Disease

- Candidiasis
- Cryptococcosis
- Histoplasmosis
- Pneumocystis

Bacterial Disease

- Acute rheumatic fever
- Botulism
- Chlamydia
- Cholera
- Diphtheria
- Gonococcal infections
- Salmonellosis
- Shigellosis
- Tetanus

Mycobacterial Disease

- Atypical mycobacterial disease
- Tuberculosis

Parasitic Disease

- Helminth infestations
- Malaria
- Pinworms
- Toxoplasmosis

Spirochetal Disease

- Lyme disease
- Rocky Mountain spotted fever
- Syphilis

Viral Disease

- Cytomegalovirus infections
- Epstein-Barr virus infections
- Erythema infectiosum
- Herpes simplex
- HIV infection
- Human papillomavirus infections
- Influenza
- Measles
- Mumps
- Rabies
- Roseola
- Rubella
- Varicella-zoster virus infections

The Musculoskeletal System

Disorders of the Shoulder

- Fractures/dislocations
- Soft tissue injuries

Disorders of the Forearm/Wrist/Hand

- Fractures/dislocations
- Soft tissue injuries

Disorders of the Back/Spine

- Ankylosing spondylitis
- Back strain/sprain
- Cauda equina
- Herniated nucleus pulposus
- Kyphosis
- Low back pain
- Scoliosis
- Spinal stenosis

Disorders of the Hip

- Avascular necrosis
- Developmental dysplasia
- Fractures/dislocations
- Slipped capital femoral epiphysis

Disorders of the Knee

- Fractures/dislocations
- Osgood-Schlatter disease
- Soft tissue injuries

Disorders of the Ankle/Foot

- Fractures/dislocations
- Soft tissue injuries

Infectious Diseases

- Acute/chronic osteomyelitis
- Septic arthritis

Neoplastic Disease

- Bone cysts/tumors
- Ganglion cysts

Osteoarthritis

Osteoporosis

Compartment Syndrome

Rheumatologic Conditions

- Fibromyalgia
- Gout/pseudogout
- Juvenile rheumatoid arthritis
- Polyarteritis nodosa
- Polymyositis
- Polymyalgia rheumatica
- Reactive arthritis (Reiter syndrome)
- Rheumatoid arthritis
- Systemic lupus erythematosus
- Systemic sclerosis (Scleroderma)
- Sjögren syndrome

The Neurologic System

Diseases of Peripheral Nerves

- Complex regional pain syndrome
- Peripheral neuropathies

Headaches

- Cluster headache
- Migraine
- Tension headache

Infectious Disorders

- Encephalitis
- Meningitis

Movement Disorders

- Essential tremor
- Huntington disease
- Parkinson disease

Vascular Disorders

- Cerebral aneurysm
- Intracranial hemorrhage
- Stroke
- Transient ischemic attack

Other Neurologic Disorders

- Altered level of consciousness
- Cerebral palsy
- Concussion
- Dementias
- Delirium
- Guillain-Barré syndrome
- Multiple sclerosis
- Myasthenia gravis
- Post-concussion syndrome
- Seizure disorders
- Status epilepticus
- Syncope
- Tourette disorder

Psychiatry/Behavioral Science

Anxiety Disorders

- Generalized anxiety disorder
- Panic disorder
- Phobias
- Posttraumatic stress disorder

Attention-Deficit/Hyperactivity Disorder

Autistic Disorder

Eating Disorders

- Anorexia nervosa
- Bulimia nervosa
- Obesity

Mood Disorders

- Adjustment
- Bipolar
- Depressive
- Dysthymic

Personality Disorders

Psychoses

- Delusional disorder
- Schizophrenia

Somatoform Disorders

Substance Use Disorders

- Abuse
- Dependence
- Withdrawal

Other Behavior/Emotional Disorders

- Acute reaction to stress
- Child/elder abuse
- Conduct disorders
- Domestic violence
- Grief reaction
- Suicide

The Pulmonary system

Infectious Disorders

- Acute bronchitis
- Acute bronchiolitis
- Acute epiglottitis
- Croup
- Influenza
- Pertussis
- Pneumonias
 - Bacterial
 - Viral
 - Fungal
 - HIV-related
- Respiratory syncytial virus infection
- Tuberculosis

Neoplastic Disease

- Carcinoid tumors
- Lung cancer
- Pulmonary nodules

Obstructive Pulmonary Disease

- Asthma
- Bronchiectasis
- Chronic bronchitis
- Cystic fibrosis
- Emphysema

Pleural Diseases

- Pleural effusion
- Pneumothorax

Pulmonary Circulation

- Cor pulmonale
- Pulmonary embolism
- Pulmonary hypertension

Restrictive Pulmonary Disease

- Idiopathic pulmonary fibrosis
- Pneumoconiosis
- Sarcoidosis

Other Pulmonary Disease

- Acute respiratory distress syndrome
- Hyaline membrane disease
- Foreign body aspiration

The Reproductive System

Uterus

- Dysfunctional uterine bleeding
- Endometrial cancer
- Endometriosis
- Leiomyoma
- Prolapse

Ovary

- Cysts
- Neoplasms

Cervix

- Carcinoma
- Cervicitis
- Dysplasia
- Incompetent

Vagina/Vulva

- Cystocele
- Neoplasm
- Prolapse
- Rectocele
- Vaginitis

Menstrual Disorders

- Amenorrhea
- Dysmenorrhea
- Premenstrual syndrome

Menopause

Breast

- Abscess
- Carcinoma
- Fibroadenoma
- Fibrocystic disease
- Gynecomastia
- Galactorrhea
- Mastitis

Pelvic Inflammatory Disease

Contraceptive Methods

Infertility

Uncomplicated Pregnancy

- Normal labor/delivery
- Prenatal diagnosis/care

Complicated Pregnancy

- Abortion
- Abruptio placentae
- Cesarean section
- Dystocia
- Ectopic pregnancy
- Fetal distress
- Gestational diabetes
- Gestational trophoblastic disease
- Hypertension disorders in pregnancy
- Multiple gestation
- Placenta previa
- Postpartum hemorrhage
- Premature rupture of membranes
- Rh incompatibility

Knowledge Areas and Skills

The lists of knowledge areas and skills that follow were identified as important to physician assistant practice through an intensive practice analysis. Many of these knowledge areas and associated cognitive skills are covered on NCCPA's examinations.

History Taking and Physical Examination

Knowledge of:

- ✓ Pertinent historical information associated with selected medical conditions
- ✓ Risk factors for development of selected medical conditions
- ✓ Signs and symptoms of selected medical conditions
- ✓ Physical examination techniques
- ✓ Physical examination findings associated with selected medical conditions
- ✓ Appropriate physical examination directed to selected medical conditions
- ✓ Differential diagnosis associated with presenting symptoms or physical findings

Cognitive skills in:

- ✓ Conducting comprehensive and focused interviews
- ✓ Identifying pertinent historical information
- ✓ Performing comprehensive and focused physical examinations
- ✓ Associating current complaint with presented history
- ✓ Identifying pertinent physical examination information

Using Laboratory and Diagnostic Studies

Knowledge of:

- ✓ Indications for initial and subsequent diagnostic or laboratory studies
- ✓ Cost effectiveness of diagnostic studies or procedures
- ✓ Relevance of common screening tests for selected medical conditions

- ✓ Normal and abnormal diagnostic ranges
- ✓ Risks associated with diagnostic studies or procedures
- ✓ Appropriate patient education related to laboratory or diagnostic studies

Cognitive skills in:

- ✓ Using diagnostic equipment safely and appropriately
- ✓ Selecting appropriate diagnostic or laboratory studies
- ✓ Collecting diagnostic or laboratory specimens
- ✓ Interpreting diagnostic or laboratory studies results

Formulating Most Likely Diagnosis

Knowledge of:

- ✓ Significance of history as it relates to differential diagnosis
- ✓ Significance of physical findings as they relate to diagnosis
- ✓ Significance of diagnostic and laboratory studies as they relate to diagnosis

Cognitive skills in:

- ✓ Correlating normal and abnormal diagnostic data
- ✓ Formulating differential diagnosis
- ✓ Selecting the most likely diagnosis in light of presented data

Clinical Intervention

Knowledge of:

- ✓ Management and treatment of selected medical conditions
- ✓ Indications, contraindications, complications, risks, benefits and techniques for selected procedures
- ✓ Standard precautions and special isolation conditions
- ✓ Sterile technique
- ✓ Follow-up and monitoring of therapeutic regimens
- ✓ Conditions that constitute medical emergencies
- ✓ Indications for admission to or discharge from hospitals or other facilities

- ✓ Discharge planning
- ✓ Available community resources
- ✓ Appropriate community resources
- ✓ Appropriate patient education
- ✓ Roles of other health professionals
- ✓ End-of-life issues
- ✓ Risks and benefits of alternative medicine

Cognitive skills in:

- ✓ Formulating and implementing treatment plans
- ✓ Recognizing and initiating treatment for life-threatening emergencies
- ✓ Demonstrating technical expertise related to performing specific procedures
- ✓ Communicating effectively
- ✓ Using counseling techniques
- ✓ Facilitating patient adherence and active participation in treatment
- ✓ Interacting effectively in multidisciplinary teams

Pharmaceutical Therapeutics

Knowledge of:

- ✓ Mechanism of action
- ✓ Indications for use
- ✓ Contraindications
- ✓ Side effects
- ✓ Adverse reactions
- ✓ Follow-up and monitoring of pharmacologic regimens
- ✓ Risks for drug interactions
- ✓ Clinical presentation of drug interactions
- ✓ Treatment of drug interactions
- ✓ Drug toxicity
- ✓ Methods to reduce medication errors
- ✓ Cross reactivity of similar medications
- ✓ Recognition and treatment of allergic reactions

Cognitive skills in:

- ✓ Selecting appropriate pharmacologic therapy for selected medical conditions
- ✓ Monitoring pharmacologic regimens and adjusting as appropriate
- ✓ Evaluating and reporting adverse drug reactions

Health Maintenance

Knowledge of:

- ✓ Epidemiology of selected medical conditions
- ✓ Early detection and prevention of selected medical conditions
- ✓ Relative value of common screening tests
- ✓ Appropriate patient education regarding preventable conditions or lifestyle modifications
- ✓ Healthy lifestyles
- ✓ Prevention of communicable diseases
- ✓ Immunization schedules and recommendations for infants, children, adults and foreign travelers
- ✓ Risks and benefits of immunization
- ✓ Human growth and development
- ✓ Human sexuality
- ✓ Occupational and environmental exposure
- ✓ Impact of stress on health
- ✓ Psychological manifestations of illness and injury
- ✓ Effects of aging and changing family roles on health maintenance and disease prevention
- ✓ Signs of abuse and neglect
- ✓ Barriers to care

Cognitive skills in:

- ✓ Using counseling and patient education techniques
- ✓ Communicating effectively with patients to enhance health maintenance
- ✓ Adapting health maintenance to the patient's context
- ✓ Using informational databases

Applying Basic Science Concepts

Knowledge of:

- ✓ Human anatomy and physiology
- ✓ Underlying pathophysiology
- ✓ Microbiology and biochemistry

Cognitive skills in:

- ✓ Recognizing normal and abnormal anatomy and physiology
- ✓ Relating pathophysiologic principles to specific disease processes

- ✓ Correlating abnormal physical examination findings to a given disease process
- ✓ Correlating abnormal results of diagnostic tests to a given disease process

Exam Development & Scoring

NCCPA's exam questions are developed by committees comprising PAs and physicians selected based on both their item writing skills, experience and references as well as demographic characteristics (i.e., practice specialty, geographic region, practice setting, etc.). The test committee members each independently write a certain number of test questions or items, referencing each to a recently published textbook (not journal articles). Each item then goes through an intense review by content experts and medial editors from which only some items emerge for pre-testing. Every NCCPA exam includes both scored and pre-test items, and examinees have no way of distinguishing between the two. This allows NCCPA to collect important statistics about how the pre-test items perform on the exam, which informs the final decision about whether a particular question meets the standards for inclusion as a scored item on future PANCE or PANRE exams.

Pathway II exams are developed in much the same way as PANCE and PANRE exams. However, Pathway II questions are not pre-tested due to the nature of that exam. Rather, after a preliminary analysis of each Pathway II administration's results, statistical analyses are used to identify items that appear to have been problematic or even flawed. Through this validation process, content experts review those items to determine whether the answers had been keyed incorrectly in the scoring system or whether the item itself was flawed in some way. Also, from time to time Pathway II examinees will contact NCCPA with questions or concerns about particular exam items, which are also reviewed during the validation process. When the content experts identify a flawed item, it is removed from the group of scored items and is not included in the scoring process.

When NCCPA exams are scored, candidates are initially awarded 1 point for every correct answer and 0 points for incorrect answers to produce a raw score. After examinees' raw scores have been computed by two independent computer systems to ensure accuracy, the scored response records for PANCE and PANRE examinees are entered into a maximum likelihood estimation procedure, a sophisticated, mathematically-based procedure that uses the difficulties of all the scored items in the form taken by an individual examinee as well as the number of correct responses to calculate that examinee's proficiency measure. This calculation

is based on the *Rasch model* and equates the scores, compensating for minor differences in difficulty across different versions of the exam. Thus, in the end, all proficiency measures are calculated as if everyone took the same exam. (That step is not necessary for Pathway II since all examinees in a given administration take the same exam.)

Finally, the proficiency measure is converted to a scaled score so that results can be compared over time and among different groups of examinees. The scale is based on the performance of a reference group (some particular group of examinees who took the exam in the past) whose scores were scaled so that the average proficiency measure was assigned a scaled score of 500 and the standard deviation was established at 100. The vast majority of scores fall between 200 and 800. More details on the reference group for each exam and the calculation of scores will be provided in the form of *Performance Interpretation Guidelines* published with your exam results.

Example Question

The questions on NCCPA exams are presented in multiple-choice format and most offer four or five answer choices. An increasing percentage of exam questions are based on information presented in a clinical vignette, which requires higher level thinking than some other common question formats.

A 58-year-old man who has a history of alcohol abuse complains of severe epigastric pain. He feels some relief from the pain when he leans forward. In the past 24 hours he has experienced nausea and vomiting. He appears acutely ill and restless. On physical examination, the patient is hypotensive and has a rapid pulse rate. Bowel sounds are hypoactive, and there is abdominal tenderness with muscular rigidity and distention. The diagnosis would be supported best by which of the following laboratory tests?

- (A) Determination of the serum amylase level
- (B) Electrocardiography
- (C) Examination of the stool for ova and parasites
- (D) Routine urinalysis
- (E) Upper gastrointestinal series