**Purpose of the exam**

The exam is designed to evaluate the knowledge, diagnostic reasoning, and clinical judgment skills expected of the certified nephrologist in the broad domain of the discipline. The ability to make appropriate diagnostic and management decisions that have important consequences for patients will be assessed. The exam may require recognition of common as well as rare clinical problems for which patients may consult a certified nephrologist.

**Exam content**

Exam content is determined by a pre-established blueprint, or table of specifications. The blueprint is developed by the ABIM and is reviewed annually and updated as needed for currency. Trainees, training program directors, and certified practitioners in the discipline are surveyed periodically to provide feedback and inform the blueprinting process.

The primary medical content categories of the blueprint are shown below, with the percentage assigned to each for a typical exam:

<table>
<thead>
<tr>
<th>Medical Content Category</th>
<th>% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium and Water Abnormalities</td>
<td>8%</td>
</tr>
<tr>
<td>Acid-Base and Potassium Disorders</td>
<td>9%</td>
</tr>
<tr>
<td>Calcium, Phosphorus, and Magnesium Disorders and Stones</td>
<td>4%</td>
</tr>
<tr>
<td>Chronic Kidney Disease</td>
<td>22%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>10%</td>
</tr>
<tr>
<td>Tubular, Interstitial, and Cystic Disorders</td>
<td>4%</td>
</tr>
<tr>
<td>Glomerular and Vascular Disorders</td>
<td>12%</td>
</tr>
<tr>
<td>Kidney Transplantation</td>
<td>11%</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>5%</td>
</tr>
<tr>
<td>Acute Kidney Injury and Intensive Care Unit Nephrology</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Exam questions in the content areas above may also address clinical topics in adolescent medicine, critical care medicine, clinical epidemiology, geriatric medicine, and nutrition that are important to the practice of nephrology.

*ABIM is committed to working toward health equity and believes that board-certified physicians should have an understanding of health care disparities. Therefore, health equity content that is clinically important to each discipline will be included in assessments, and the use of gender, race, and ethnicity identifiers will be re-evaluated.*

**Exam format**

The exam is composed of up to 240 single-best-answer multiple-choice questions, of which approximately 40 are new questions that do not count in the examinee’s score. Most questions describe patient scenarios and ask about the work done (that is, tasks performed) by physicians in the course of practice:

- Making a diagnosis
- Ordering and interpreting results of tests
- Recommending treatment or other patient care
- Assessing risk, determining prognosis, and applying principles from epidemiologic studies
- Understanding the underlying pathophysiology of disease and basic science knowledge applicable to patient care

Clinical information presented may include patient photographs, ultrasound images, angiograms, micrographs, radiographs, electrocardiograms, and other media to illustrate relevant patient findings. Learn more information on how exams are developed.

A tutorial including examples of ABIM exam question format can be found at [http://www.abim.org/certification/exam-information/nephrology/exam-tutorial](http://www.abim.org/certification/exam-information/nephrology/exam-tutorial).

The blueprint can be expanded for additional detail as shown below. Each of the medical content categories is listed there, and below each major category are the content subsections and specific topics that *may* appear in the exam. Please note: actual exam content may vary.
### Sodium and Water Abnormalities

<table>
<thead>
<tr>
<th>Hyponatremia</th>
<th>3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotonic</td>
<td></td>
</tr>
<tr>
<td>Sydrome of inappropriate antidiuretic hormone secretion (SIADH)</td>
<td></td>
</tr>
<tr>
<td>Hypervolemic</td>
<td></td>
</tr>
<tr>
<td>Low solute intake</td>
<td></td>
</tr>
<tr>
<td>Thiazides</td>
<td></td>
</tr>
<tr>
<td>Other hypotonic (secondary adrenal insufficiency)</td>
<td></td>
</tr>
<tr>
<td>Hypertonic</td>
<td></td>
</tr>
<tr>
<td>Isotonic (pseudohyponatremia)</td>
<td></td>
</tr>
</tbody>
</table>

**Hyponatremia or serum hyperosmolality**<2%

| Osmotic diuresis |    |
| Urea            |    |
| Glucose         |    |

**Water diuresis**

| Central diabetes insipidus |    |
| Nephrogenic diabetes insipidus |    |
| Other water diuresis (physiologic saline diuresis) |    |

Other hyponatremia or serum hyperosmolality (hypodipsia; extrarenal water loss)

**Salt excess (edema)** 2.5%

| Heart failure |    |
| Cirrhosis    |    |
| Nephrotic syndrome |    |
| Chronic kidney disease |    |

**Salt depletion** <2%

| Renal sodium losses |    |
| Postobstructive diuresis |    |
| Post-acute kidney injury diuresis |    |
| Salt-wasting nephropathy |    |
| Diuretics |    |
| Other renal sodium losses (chemotherapy-induced) |    |

Extrarenal sodium losses

**Polyuria** <2%

<p>| Primary polydipsia |    |
| Other polyuria (iatrogenic) |    |</p>
<table>
<thead>
<tr>
<th>Disease</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metabolic acidosis</strong></td>
<td>3.5%</td>
</tr>
<tr>
<td>Metabolic acidosis (normal anion gap)</td>
<td></td>
</tr>
<tr>
<td>Renal tubular acidosis (normokalemic or hypokalemic)</td>
<td></td>
</tr>
<tr>
<td>Renal tubular acidosis (hyperkalemic)</td>
<td></td>
</tr>
<tr>
<td>Nonrenal causes</td>
<td></td>
</tr>
<tr>
<td>Metabolic acidosis (elevated anion gap)</td>
<td></td>
</tr>
<tr>
<td>Lactic acidosis</td>
<td></td>
</tr>
<tr>
<td>Ketoacidosis</td>
<td></td>
</tr>
<tr>
<td>Toxins</td>
<td></td>
</tr>
<tr>
<td>Uremic</td>
<td></td>
</tr>
<tr>
<td>Other metabolic acidosis (low anion gap in multiple myeloma)</td>
<td></td>
</tr>
<tr>
<td><strong>Metabolic alkalosis</strong></td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Associated with normal or low blood pressure</td>
<td></td>
</tr>
<tr>
<td>Renal origin</td>
<td></td>
</tr>
<tr>
<td>Other metabolic alkalosis associated with normal or low blood pressure (chemotherapy-induced; hypokalemia; post-hypercapnic)</td>
<td></td>
</tr>
<tr>
<td>Associated with high blood pressure</td>
<td></td>
</tr>
<tr>
<td>Adrenal</td>
<td></td>
</tr>
<tr>
<td>Other metabolic alkalosis associated with high blood pressure (malignant hypertension)</td>
<td></td>
</tr>
<tr>
<td><strong>Respiratory acid-base disturbances</strong></td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Respiratory acidosis</td>
<td></td>
</tr>
<tr>
<td>Respiratory alkalosis</td>
<td></td>
</tr>
<tr>
<td><strong>Mixed acid-base disturbances</strong></td>
<td>&lt;2%</td>
</tr>
<tr>
<td><strong>Potassium disturbances</strong></td>
<td>3.5%</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td></td>
</tr>
<tr>
<td>Pseudohyperkalemia</td>
<td></td>
</tr>
<tr>
<td>Transcellular shifts</td>
<td></td>
</tr>
<tr>
<td>Medication-induced</td>
<td></td>
</tr>
<tr>
<td>Genetic abnormalities</td>
<td></td>
</tr>
<tr>
<td>Other tubular disorders (hepatitis-associated)</td>
<td></td>
</tr>
<tr>
<td>Postsurgical</td>
<td></td>
</tr>
<tr>
<td>Other hyperkalemia (peritoneal dialysis)</td>
<td></td>
</tr>
<tr>
<td>Hypokalemia</td>
<td></td>
</tr>
<tr>
<td>Pseudohypokalemia</td>
<td></td>
</tr>
<tr>
<td>Transcellular shifts</td>
<td></td>
</tr>
</tbody>
</table>
Renal losses
Nonrenal losses
Other hypokalemia (combined therapeutic hypothermia and barbiturate coma)

## Calcium, Phosphorus, and Magnesium Disorders and Stones 4% of Exam

### Disorders of calcium metabolism <2%
- Hypercalcemia
  - Primary hyperparathyroidism
  - Granulomatous diseases
  - Malignancy
  - Familial hypocalciuric hypercalcemia (FHH)
  - Vitamin D toxicity
  - Medication and vitamin-induced
  - Milk alkali syndrome
- Hypocalcemia
  - Hypoparathyroidism
  - Pseudohypoparathyroidism
  - Medication-induced
  - Tissue deposition
  - Vitamin D deficiency

### Disorders of phosphate metabolism <2%
- Hyperphosphatemia
  - Decreased renal excretion
  - Increased intake
  - Tissue redistribution
  - Genetic causes
- Hypophosphatemia
  - Increased renal excretion
  - Decreased intake and gastrointestinal absorption
  - Tissue redistribution

### Disorders of magnesium metabolism <2%
- Hypermagnesemia
  - Decreased renal excretion
  - Increased intake
- Hypomagnesemia
  - Increased renal excretion
  - Decreased gastrointestinal absorption
Nephrolithiasis <2%
Calcium stones
  Idiopathic hypercalciuria
  Hypocitraturia
  Hyperoxaluria
  Primary hyperparathyroidism
  Distal renal tubular acidosis
  Other calcium stones (medullary sponge kidney; hypercalciuria in hypoparathyroidism)
Uric acid stones
  Idiopathic
  Other uric acid (postileostomy)
Struvite stones
Cystine stones
Drug stones

Chronic Kidney Disease 22% of Exam

Kidney function parameters <2%
  Glomerular filtration rate (creatinine clearance; estimated glomerular filtration rate)
  Proteinuria
  Other kidney function parameters (glycemic control; biopsy)

Etiologies of chronic kidney disease <2%
  Diabetic kidney disease
  Nondiabetic kidney disease
    Chronic glomerulonephritis
    Hypertensive nephropathy
    Chronic interstitial nephritis
    Genetic diseases

Progression of chronic kidney disease <2%

Chronic kidney disease complications <2%
  Hypertension
  Fluid overload
  Anemia and iron deficiency
  Hyperkalemia
  Acidosis
  Protein-energy wasting
Other complications of chronic kidney disease
  (hyperparathyroidism; hyperphosphatemia)

**Stage IV and V chronic kidney disease**  
<2%

- Advanced uremic symptoms
- Preparation for end-stage renal disease
- Initiation and discontinuation of maintenance dialysis
- Other stage IV and V chronic kidney disease
  (parathyroid hormone monitoring)

**End-stage renal disease**  
11.5%

- Hemodialysis
  - Adequacy and prescription
  - Dialyzers and dialysate
  - Vascular access
  - Water treatment
- Hemodialysis complications
  - Hypertension
  - Hypotension
  - Interdialytic weight gain
  - Electrolyte abnormalities
  - Vascular access complications (clotting, dysfunction, infection)
  - Other hemodialysis complications (embolism and thrombosis; heparin-induced thrombocytopenia; loss of residual renal function; hypoalbuminemia)
- Peritoneal dialysis
  - Adequacy and prescription
  - Dialysate
  - Catheters
  - Other peritoneal dialysis issues (hyperkalemia)
- Peritoneal dialysis complications
  - Peritonitis and infections
  - Ultrafiltration failure
  - Other peritoneal dialysis complications (inguinal hernia; atrial fibrillation; peripheral edema)
- Home hemodialysis
- End-stage renal disease complications
  - Anemia
  - Cardiovascular disease
  - Blood pressure abnormalities
Other complications (hemolysis; hypoalbuminemia; thrombosis; calciphylaxis; uremic polyneuropathy)

Medical director responsibilities and conditions of coverage

**Mineral bone disease** 3%
- Laboratory abnormalities
  - Hyperphosphatemia
  - Hyperparathyroidism
  - Other laboratory abnormalities (calcium balance)
- Renal osteodystrophy (and related pathophysiology)
  - Osteitis fibrosis
  - Adynamic bone disease
  - Osteomalacia
  - Mixed uremic osteodystrophy
  - Other renal osteodystrophy, including low bone mass
    (osteoporosis)
- Extraosseous and vascular calcification
  - Medial calcification
  - Calciphylaxis
  - Other extraosseous and vascular calcification, including visceral organs

**Special topics in chronic kidney disease** <2%
- Epidemiology
- Ethical considerations
- Pregnancy
- Laboratory studies
- Dermatology
- Nephrotoxicity of environmental and occupational agents
  - Lead
  - Organic solvents
  - Other nephrotoxicity of environmental and occupational agents (cadmium; mercury)
- Other special topics in chronic kidney disease (obesity)

**Hypertension** 10% of Exam

**Essential hypertension** 3.5%
- Isolated systolic hypertension
- Severe hypertension
- Resistant hypertension
White coat hypertension
Pseudohypertension
Masked hypertension
Other essential hypertension (stage 2 hypertension; thiazide effect)

**Secondary causes of hypertension**

Pheochromocytoma
Renal vascular disease
  - Dissection
  - Atherosclerotic
Hyperaldosteronism
  - Adrenal adenoma
  - Adrenal hyperplasia
Genetic causes
  - Liddle syndrome
  - Dexamethasone suppressible hyperaldosteronism
  - Other genetic causes (Hashimoto’s thyroiditis; scleroderma renal crisis)
Miscellaneous causes
  - Renin-secreting tumor (juxtaglomerular cell tumor)
  - Syndrome of apparent mineralocorticoid excess
  - Coarctation
  - Vasculitis and arteritis
  - Tuberous sclerosis
  - Sleep apnea
  - Drug-induced
  - Obstructive uropathy
  - Renal compression (Page kidney)
  - Cushing syndrome
  - Other miscellaneous causes
    - (chronic kidney disease; obesity)

**End-organ damage resulting from hypertension**

- Acute kidney injury
- Central nervous system and ophthalmologic
- Cardiac (left ventricular hypertrophy; heart failure)

**Hypertension in special situations**

- Pregnancy
- Stroke or subarachnoid bleeding
- Other hypertension in special situations
Tubular, Interstitial, and Cystic Disorders 4% of Exam

Renal tubular disorders and Fanconi’s syndrome <2%
Drug-induced
Crystal deposition
Genetic

Tubulointerstitial nephritis 2%
Acute
Drug-induced
Immune
Infectious
Other acute tubulointerstitial nephritis (multifactorial)
Chronic
Drug-induced
Immune
Granulomatous
Toxins
Hemoglobinopathy
Urinary tract infection
Other chronic tubulointerstitial nephritis (hypokalemic nephropathy; medullary cystic kidney)

Renal cystic disease <2%
Autosomal dominant polycystic kidney disease (ADPKD)
Genetics
Renal manifestations
Nonrenal manifestations
End-stage renal disease
Drug-induced

Renal mass <2%

Glomerular and Vascular Disorders 12% of Exam

Nephritic glomerular disorders, vasculitis, and vasculopathy 5%
IgA nephropathy and Henoch-Schönlein purpura
Vasculitis and antineutrophil cytoplasmic antibody
Anti-glomerular basement membrane disease
Lupus nephritis
Postinfectious glomerulonephritis
Membranoproliferative glomerulonephritis and C3 glomerulopathies
Cryoglobulinemic glomerulonephritis
Crescentic glomerulonephritis
Other disorders (rapidly progressive glomerulonephritis)

**Nephrotic and heavy-proteinuric glomerular disorders** 5%

- Minimal change disease
  - Primary
  - Secondary
- Focal segmental glomerulosclerosis
  - Primary
  - Secondary
  - Genetic
- Membranous nephropathy
  - Primary
  - Secondary
- Paraprotein-related disorders
  - Primary amyloidosis
  - Secondary amyloidosis
  - Light chain deposition disease and myeloma
  - Other paraprotein-related disorders
- Fibrillary and immunotactoid glomerulonephritis
- Fabry’s disease
- Other disorders (biopsy complication)

**Thin basement membrane nephropathy and Alport’s syndrome** <2%

**Thrombotic microangiopathies** <2%

**Hemolytic uremic syndrome** <2%

- Shiga toxin-mediated hemolytic uremic syndrome
- Atypical hemolytic uremic syndrome
  - Drug-associated atypical hemolytic uremic syndrome
    (anticancer drugs, clopidogrel, interferon, quinine)
  - Other atypical hemolytic uremic syndrome
    (pregnancy-associated)

**Scleroderma renal disease** <2%
Kidney Transplantation

Pre-transplantation

Transplant immunology
- Detection of pre-transplant alloreactivity and immunologic evaluation of transplant candidates

Potential kidney transplant recipient evaluation
- Glomerular filtration rate listing requirements
- Cancer concerns
- Infection concerns
- Cardiac concerns
- Age concerns
- Comorbidities
- Other potential kidney transplant recipient evaluation (recurrent autoimmune kidney disease)

Potential living kidney donor
- Donor evaluation
- Risks
- Ethics

Organ allocation
- Deceased donor wait list
- Organ shortage strategies
- Paired kidney donation and chains

Transplantation

Indications
- Contraindications
- Deceased donor kidney transplantation
  - Types
  - Outcomes
- Living donor kidney transplant
  - Types
  - Outcomes

Post-transplantation

Immunosuppression
- Induction
- Maintenance

Short-term post-transplantation management
- Perioperative management and complications
- Graft dysfunction
Long-term post-transplantation management
  Graft dysfunction
  Complications
  Other long-term post-transplantation management
    (graft failure)
Rejection
  Hyperacute
  T cell
  Antibody-mediated
Male and female fertility
  Pregnancy
  Male fertility
Multiorgan and extrarenal transplantation  <2%
Ethics, society, and public policy  <2%

<table>
<thead>
<tr>
<th>Pharmacology</th>
<th>5% of Exam</th>
</tr>
</thead>
</table>

**Basic pharmacology**  <2%
  - Pharmacokinetics and other basic concepts
  - Renal handling of drugs
  - Principles of dialytic drug removal

**Drug selection in kidney disease**  <2%
  - Antibiotics
    - Vancomycin
    - Aminoglycosides
    - Other antibiotics (cephalosporins)
  - Antineoplastic agents
  - Antiviral agents
  - Other drug selection in kidney disease (metformin; fentanyl)

**Nephrotoxicity of medications**  2%
  - Principles and mechanisms of nephrotoxicity
  - Antibacterial agents
    - Aminoglycosides
    - Vancomycin
  - Antiviral agents
  - Antifungal agents
  - Antiparasitic agents
  - Additional antimicrobials
Pain medications
  Nonsteroidal anti-inflammatory drugs
  Fentanyl
  Gabapentin
  Tramadon

Renin-angiotensin-aldosterone system (RAAS) blockade
  Angiotensin-converting enzyme inhibitors,
  angiotensin receptor blockers, and renin inhibitors
  Aldosterone antagonists

Antihypertensive agents
  Beta-adrenergic blockers
  Calcium channel blockers
  Minoxidil

Antineoplastic chemotherapy agents
  Interferon
  Cisplatin
  Methotrexate
  Vascular endothelial growth factor inhibitors
  Immune checkpoint inhibitors

Iodinated contrast and other imaging agents
  Lithium

Supplements and herbs
  Aristolochic acid
  SGLT2 inhibitors

Other nephrotoxicity of medications (cardiac glycosides; bisphosphonates)

Nephrotoxicity of illicit drugs
  Heroin and other intravenous drugs
  Ecstasy
  Cocaine

Drug-drug interactions and adverse effects other than nephrotoxicity

Dialysis and other treatment of toxic substances
  Ethylene glycol
  Methanol
  Other alcohols
  Lithium
  Other dialysis and treatment of toxic substances (salicylates; dialysis duration prescription)
**Hemodynamic (prerenal) acute kidney injury**

- True volume depletion
  - Renal
  - Extrarenal

- Effective volume depletion
  - Heart failure
  - Cirrhosis
  - Nephrotic syndrome

**Drugs**

- Nonsteroidal anti-inflammatory drugs
- Calcineurin inhibitors
- Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers
- Radiocontrast agents
- Other drugs (anticoagulants; interferon)

**Abdominal compartment syndrome**

**Parenchymal (intrinsic) acute kidney injury**

- Vascular
  - Systemic diseases and vasculitis
  - Atheroemboli
  - Renal vein thrombosis

- Glomerular
  - Drug-induced
  - Infectious
  - Other glomerular parenchymal acute kidney injury (relapsed microscopic polyangiitis)

- Tubular
  - Ischemic
  - Nephrotoxic
  - Systemic disease

- Interstitial
  - Drugs
  - Systemic disease
  - Malignancy (infiltrative)
Postrenal acute kidney injury

- Retroperitoneal and ureteral
  - Idiopathic retroperitoneal fibrosis
  - Malignancy
  - Stones and crystals
  - Bleeding
- Bladder, bladder outlet, and benign prostatic hyperplasia

<2%

Renal replacement therapy

- Indications
  - Solute accumulation (potassium, hydrogen ions, phosphate, urea)
  - Hemodynamic
  - Acute kidney injury associated with intoxication
  - Tumor lysis syndrome

- Techniques
  - Intermittent hemodialysis
  - Continuous renal replacement therapy

- Renal replacement therapy prescription
  - Dialysate and replacement fluid
  - Anticoagulation

- Complications
  - Hemodynamic
  - Citrate intoxication
  - Other complications (dialysis disequilibrium syndrome, electrolyte abnormalities)

4%

Intensive care unit nephrology

- Hemodynamic measures
- Intravenous fluids and volume status
- Ethics and palliative care

2%

July 2023