**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.](http://www.abim.org/certification/exam-information/nephrology/exam-tutorial.aspx)

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

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 8% of Exam

Hyponatremia 3%
- Hypotonic
  - Syndrome of inappropriate antidiuretic hormone secretion (SIADH)
  - Hypervolemic
  - Low solute intake
  - Thiazides
  - Other hypotonic (secondary adrenal insufficiency)
- Hypertonic
- Isotonic (pseudohyponatremia)

Hypernatremia or serum hyperosmolality <2%
- Osmotic diuresis
  - Urea
  - Glucose
- Water diuresis
  - Central diabetes insipidus
  - Nephrogenic diabetes insipidus
  - Other water diuresis (physiologic saline diuresis)
- Other hypernatremia 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%
- Primary polydipsia
- Other polyuria (iatrogenic)
Acid-Base and Potassium Disorders  

<table>
<thead>
<tr>
<th>Metabolic acidosis</th>
<th>3.5%</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metabolic alkalosis</th>
<th>&lt;2%</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respiratory acid-base disturbances</th>
<th>&lt;2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory acidosis</td>
<td></td>
</tr>
<tr>
<td>Respiratory alkalosis</td>
<td></td>
</tr>
</tbody>
</table>

| Mixed acid-base disturbances | <2% |

<table>
<thead>
<tr>
<th>Potassium disturbances</th>
<th>3.5%</th>
</tr>
</thead>
<tbody>
<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

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

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

Progression of chronic kidney disease

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

**Stage 4 and 5 chronic kidney disease** <2%
- Advanced uremic symptoms
- Preparation for end-stage kidney disease
- Initiation and discontinuation of maintenance dialysis
- Other stage 4 and 5 chronic kidney disease (parathyroid hormone monitoring)

**End-stage kidney 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 kidney 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**

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**

- Epidemiology
- Ethical considerations
- Pregnancy
- 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)

<table>
<thead>
<tr>
<th>Hypertension</th>
<th>10% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential hypertension</td>
<td>3.5%</td>
</tr>
</tbody>
</table>
- 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

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal tubular disorders and Fanconi’s syndrome</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Drug-induced</td>
<td></td>
</tr>
<tr>
<td>Crystal deposition</td>
<td></td>
</tr>
<tr>
<td>Genetic</td>
<td></td>
</tr>
<tr>
<td>Tubulointerstitial nephritis</td>
<td>2%</td>
</tr>
<tr>
<td>Acute</td>
<td></td>
</tr>
<tr>
<td>Drug-induced</td>
<td></td>
</tr>
<tr>
<td>Immune</td>
<td></td>
</tr>
<tr>
<td>Infectious</td>
<td></td>
</tr>
<tr>
<td>Other acute tubulointerstitial nephritis (multifactorial)</td>
<td></td>
</tr>
<tr>
<td>Chronic</td>
<td></td>
</tr>
<tr>
<td>Drug-induced</td>
<td></td>
</tr>
<tr>
<td>Immune</td>
<td></td>
</tr>
<tr>
<td>Granulomatous</td>
<td></td>
</tr>
<tr>
<td>Toxins</td>
<td></td>
</tr>
<tr>
<td>Hemoglobinopathy</td>
<td></td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td></td>
</tr>
<tr>
<td>Other chronic tubulointerstitial nephritis (hypokalemic nephropathy; medullary cystic kidney)</td>
<td></td>
</tr>
<tr>
<td>Renal cystic disease</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Autosomal dominant polycystic kidney disease (ADPKD)</td>
<td></td>
</tr>
<tr>
<td>Genetics</td>
<td></td>
</tr>
<tr>
<td>Renal manifestations</td>
<td></td>
</tr>
<tr>
<td>Nonrenal manifestations</td>
<td></td>
</tr>
<tr>
<td>End-stage kidney disease</td>
<td></td>
</tr>
<tr>
<td>Drug-induced</td>
<td></td>
</tr>
<tr>
<td>Renal mass</td>
<td>&lt;2%</td>
</tr>
</tbody>
</table>

### Glomerular and Vascular Disorders  12% of Exam

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nephritic glomerular disorders, vasculitis, and vasculopathy</td>
<td>5%</td>
</tr>
<tr>
<td>IgA nephropathy and IgA-associated vasculitis (Henoch-Schönlein purpura)</td>
<td></td>
</tr>
<tr>
<td>Vasculitis and antineutrophil cytoplasmic antibody</td>
<td></td>
</tr>
<tr>
<td>Anti-glomerular basement membrane disease</td>
<td></td>
</tr>
<tr>
<td>Lupus nephritis</td>
<td></td>
</tr>
<tr>
<td>Postinfectious glomerulonephritis</td>
<td></td>
</tr>
</tbody>
</table>
Membranoproliferative glomerulonephritis and C3 glomerulopathies
Cryoglobulinemic glomerulonephritis
Crescentic glomerulonephritis
Other disorders (rapidly progressive glomerulonephritis)

**Nephrotic and heavy-proteinuric glomerular disorders**

- 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**

**Thrombotic microangiopathies**

**Hemolytic uremic syndrome**

- Shiga toxin-mediated hemolytic uremic syndrome
- Complement-mediated thrombotic microangiopathy (atypical hemolytic uremic syndrome)
  - Drug-associated complement-mediated thrombotic microangiopathy (atypical hemolytic uremic syndrome) (anticancer drugs, clopidogrel, interferon, hemolytic uremic syndrome)
  - Other complement-mediated thrombotic microangiopathy (atypical hemolytic uremic syndrome) (pregnancy-associated)

**Scleroderma renal disease**
# Kidney Transplantation

11% of Exam

## 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

<2%

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

## Post-transplantation

7%

- **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%

### Pharmacology 5% of Exam

#### 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
   Tramadol
   Propofol

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**
   <2%
   Heroin and other intravenous drugs
   Ecstasy
   Cocaine

**Drug-drug interactions and adverse effects other than nephrotoxicity**
   <2%

**Dialysis and other treatment of toxic substances**
   <2%
   Ethylene glycol
   Methanol
   Other alcohols
   Lithium
   Other dialysis and treatment of toxic substances (salicylates; dialysis duration prescription)
Hemodynamic (prerenal) acute kidney injury 4%
  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 4.5%
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 <2%
Retroperitoneal and ureteral
   - Idiopathic retroperitoneal fibrosis
   - Malignancy
   - Stones and crystals
   - Bleeding
Bladder, bladder outlet, and benign prostatic hyperplasia

Kidney replacement therapy 4%
Indications
   - Solute accumulation (potassium, hydrogen ions, phosphate, urea)
   - Hemodynamic
   - Acute kidney injury associated with intoxication
   - Tumor lysis syndrome
Techniques
   - Intermittent hemodialysis
   - Continuous kidney replacement therapy
Kidney replacement therapy prescription
   - Dialysate and replacement fluid
   - Anticoagulation
Complications
   - Hemodynamic
   - Citrate intoxication
   - Other complications (dialysis disequilibrium syndrome, electrolyte abnormalities)

Intensive care unit nephrology 2%
Hemodynamic measures
Intravenous fluids and volume status
Ethics and palliative care

January 2024