



Certified Nephrology Nurse–Nurse Practitioner

Certification Preparation Guide



Nephrology Nusing
Certification Commission

CNN-NP Certification Preparation Guide

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About the Nephrology Nursing Certification Commission (NNCC)

Mission

The Nephrology Nursing Certification Commission (NNCC) exists to establish certification mechanisms to promote patient safety and to improve the quality of care provided to nephrology patients.

Philosophy

NNCC supports the philosophy that there should be a diversity of examinations that will effectively provide the opportunity for certification at various levels of education, experience, and areas of practice within nephrology nursing.

Commission

NNCC was established in 1987 to develop and implement certification examinations for nephrology nursing. NNCC is separately incorporated, and an independent organization that collaborates with the Center for Nursing Education and Testing (C-NET) in test development, test administration, and test evaluation. It is the goal of NNCC to promote the highest standards of nephrology nursing practice through the development, implementation, coordination, and evaluation of all aspects of the certification and recertification processes. The NNCC is a charter member of the American Board of Nursing Specialties (ABNS). The ABNS is a membership organization that maintains a national peer review program for nursing specialty certifications.

Center for Nursing Education and Testing (C-NET)

NNCC collaborates with The Center for Nursing Education and Testing (C-NET) whose expertise in the areas of test development, administration, and evaluation is unequalled. C-NET works with the NNCC to ensure that all of the examinations offered are reliable, valid, and meet industry standards. C-NET provides a full range of test development and test administration services, including:

- Performing practice analysis surveys of specialty areas
- Developing test specifications (blueprint)
- Leading item-writing sessions
- Pilot testing of questions
- Statistical analysis of whole test and test questions
- Reporting results of testing to Board and test committees

Relationship to Professional Associations

A professional association is an organization of members for whom educational and professional offerings and events are provided. They promote professional growth, provide approved continuing education, promote, recognize, and endorse certification, but they do not administer certification examinations. Examples of professional associations are:

- American Nephrology Nurses Association (ANNA)
- National Kidney Foundation (NKF)
- National Association of Nephrology Technicians/Technologists (NANT)
- American Society of Nephrology (ASN)

The NNCC does *not* have members or provide educational programming. The NNCC promotes professional growth by developing and implementing certification examinations for nephrology nurses and technicians.

ABNS and ABSNC Accreditation

The American Board of Nursing Specialties (ABNS), established in 1991, is a not-for-profit, membership organization focused on consumer protection and improving patient outcomes by promoting specialty nursing certification. The Accreditation Board for Specialty Nursing Certification (ABSNC), formerly the ABNS Accreditation Council, is the only accrediting body specifically for nursing certification. ABSNC accreditation is a peer-review mechanism that allows nursing certification organizations to obtain accreditation by demonstrating compliance with the highest quality standards in the industry.

The NNCC is a charter member of the ABNS, and the Certified Nephrology Nurse (CNN) certification program was one of the first national certification programs to be recognized and accredited. Currently, the CNN, CDN, and CCHT examinations are accredited by ABSNC.

Organizational Structure

The NNCC is composed of nine commissioners, including one public member. The commission is comprised of members of each examination board. Officers of the NNCC include the President, President-Elect, Secretary and Treasurer. The NNCC staff includes an Executive Director, Director of Certification Services, and Certification Specialists. The management firm is Anthony J. Jannetti, Inc. in Pitman, New Jersey.

Advanced Practice Examination Board

The Advanced Practice Examination Board is made up of representatives from the CNN-NP Testing Committee. The purpose of the Exam Board is to establish, review, and update eligibility criteria relevant to certification and recertification. The members develop knowledge and activity statements for practice analyses in collaboration with the testing agency (C-NET) and the commission (NNCC). In addition, the Exam Board participates in review of the practice analysis/role delineation survey tool and data analysis, updates the examination blueprint, and completes audits of certification and recertification applications for quality assurance.

Advanced Practice Test Committee

Members of the CNN-NP Test Committee have advanced practice nursing expertise, meet licensure and education requirements, and must hold CNN-NP certification. They are responsible for writing and reviewing questions relevant to the examination. Along with the testing agency representatives, members review current item statistics and develop and revise items as needed.

Examination Development

Valid and reliable tests do not arise spontaneously from item writers. They are carefully planned to ensure that they are legally defensible and psychometrically sound. A test has a specific blueprint, or test plan, which identifies what content needs to be included on the test. In addition, there is a list of the key content or activities performed by nurse practitioners (NPs) in nephrology. Both the blueprint and the key content/activities serve as item-writing guides or "test specifications" for the item writers.

Where do these test specifications come from? The content of the CNN-NP examination is based on a practice analysis survey of NPs in nephrology that identifies the key tasks/activities performed by NPs. A national task force of NPs is brought together to plan the survey content. Following data collection, the task force reviews the survey results and makes recommendations for the CNN-NP test specifications. Most importantly, a practice analysis is performed every five years to be sure the test reflects current practice and is kept up to date.

The group that oversees CNN-NP test development is the Advanced Practice Board, which is made up of NPs with expertise in different areas of nephrology. There is also a CNN-NP Test Committee that writes the actual test questions. Item writers, who are certified CNN-NPs from a variety of geographic and practice settings, write test questions to meet the CNN-NP blueprint requirements. Members of both the Advanced Practice Board and the Test Committee are considered "content experts" concerning the knowledge and skills needed by NPs in nephrology for safe practice.

Each question on the test can be linked directly to the tasks/activities in the practice analysis survey. The Test Committee meets in person twice a year to review, evaluate, and write test questions. To be certain that the test content is accurate, all questions are validated using current nephrology references and guidelines.

The test consists of 175 questions that match the test blueprint. About 25 of the questions are new experimental or "pilot" questions that are not scored. Pilot testing of new questions allows for the evaluation of questions to determine if they are valid before they become scored questions.

The passing score of the test is determined by a panel of NPs who serve as subject matter experts (SMEs). Both experienced and newly certified NPs serve on this panel. This group performs a standard setting procedure (Angoff) in which each test question is reviewed to determine its level of difficulty. Finally, the passing score is determined. It is based on the SME panel's estimation of the level of difficulty required to identify individuals who have an acceptable level of knowledge and skill. Therefore, each candidate's test score is measured against a predetermined standard, not against the performance of other test takers. A score of about 70% correct is required to pass the CNN-NP examination.

Frequently Asked Questions

What is certification?

Certification is the formal recognition of specialized knowledge, skills, and experience. It is demonstrated by the achievement of standards identified by a nursing specialty to promote optimal health outcomes. Certification validates advanced knowledge and competence in a specialty. Licensure validates the entry level competence of basic nursing knowledge and skill and provides the legal authority to practice nursing. Certification indicates a higher degree of professional competence than the minimal requirement for licensure. It must be designed to protect the public from unsafe and incompetent caregivers, and it allows consumers of health care to easily identify competent caregivers.

Why should I get certified?

The number one reason to become certified is to help ensure patient safety. Additional reasons include professional recognition, validation of skills, self-confidence in decision-making, and enhanced credibility. Certified NPs have an up-to-date knowledge base, in part due to required ongoing professional education. Certification has been linked to improved patient safety, optimal patient outcomes, decreased errors, improved patient satisfaction, increased staff retention, and job satisfaction. In an ideal world, employers would recognize, support, and reward certification.

Am I ready to earn the CNN-NP?

To be eligible to sit for the CNN-NP Exam, candidates from the **United States and its territories** must:

- Hold a full and unrestricted license as a registered nurse in advanced practice as a nurse practitioner in the United States or its territories.
- Have a minimum of a master's degree in nursing.
- Hold current national certification as a nurse practitioner.
- Have a minimum of 2,000 hours experience as a nurse practitioner practicing in nephrology within the two (2) years prior to submitting the exam application.

Note: Effective July 2020: The applicant must have a minimum of BOTH 2,000 hours AND two (2) years as a nurse practitioner practicing in nephrology within two (2) years prior to submitting an application.

- The applicant must have completed sixty (60) contact hours of continuing education in nephrology from approved providers within the two (2) years prior to submitting the exam application.

(Please refer to the Certification Application booklet for additional information.)

How do I apply for the CNN-NP exam?

1. Download and complete all sections of the application from the NNCC website, www.nncc-exam.org. Be sure to include the last four (4) digits of your social security number as well as all required signatures.
2. Attach a clear copy of your master's degree in nursing diploma.
3. Attach clear copies of contact hour certificates to total sixty (60) contact hours specific to nephrology.
4. Attach a copy of your NP license, copy of NP certification and/or letter of recognition.
5. Have employer/collaborating MD complete their portion of the application
6. Mail the application form with the appropriate payment, to the NNCC.
7. If you need special accommodations for the examination, contact C-NET at 1-800-463-0786.

How will I know my application was received?

Within a four (4) week processing period, you will receive either an examination permit containing instructions for scheduling your exam or an incomplete application letter, requesting further information or documentation. (Note: incomplete applications are subject to an incomplete application fee.)

What study resources are available?

- The test blueprint and practice questions included in this booklet
- List of references used to validate the CNN-NP test questions, found on www.nncc-exam.org
- The **Online Practice Test** (found on www.nncc-exam.org), which is assembled to match the content areas of the test blueprint.
 - 50 multiple-choice questions available in two modes:
 - *Practice Mode*: provides the correct answer and rationale after each question
 - *Test Mode*: holds the results until the end of the test
 - Results display percentage correct by blueprint area
 - 90-day access to the test
 - Several scrambled versions of the same 50 questions are offered for retesting

Are there secrets or tricks to help me pass the exam?

Caution: Test preparation websites offering alternative and/or shortcuts to test preparation should be avoided. Exam content is confidential and is not shared with any individuals involved in test preparation activities. "Tricks of testing" and "short cut" methods for test preparation are specifically avoided when creating this exam. We test candidates on content and not on their test taking skills. If you have any questions about the best methods to prepare, please call NNCC toll free at (888) 884-6622. Our goal is that exam candidates will best use their time and money to reach the end result of demonstrating their excellence in nephrology nursing care through certification.

What should I expect the day of the test?

You should arrive at the testing center 30 minutes before your test is scheduled to begin. Bring your valid government-issued photo ID and examination permit. The name on your ID must match the name on your exam permit. Directions to the testing center can be found in the email confirming you have successfully scheduled your test. Be sure to know the best route to the testing center and pay attention to traffic reports.

- Nothing is permitted in the testing room, so you are encouraged to leave personal items at home or locked in your car. Lockers are available in some, but not all, testing centers to secure personal valuables, such as purses or wallets.
- Cell phones and all other electronic devices, including smart watches, are not permitted.
- Upon arrival you will give the proctor your photo ID. You will then have your photo taken, and sign a roster and other regulation sheets. The proctor will read the testing site rules upon registering you for the test.
- Once seated at your computer, you be given a short tutorial explaining the test setup and keyboard key functions just before your test begins.
- You will have four (4) hours to complete the exam.
- Your photo ID will be returned upon completion of the exam.

When will I get my results and how do I interpret them?

Your Score Report will be available to you at the end of your examination. If you pass the exam, the report will reflect your score as well as notify you of when to expect your certificate in the mail and when your name will appear in the NNCC Certified Directory. If you were unsuccessful on the exam, the report will reflect your score and a breakdown of the test subareas – the Content Areas on the CNN-NP Test Blueprint – with the percent of questions you answered correct in each. This breakdown of subarea scores will help you determine the blueprint areas in which you are weak and need further study.

What if I need to retest?

If you are unsuccessful on the exam, you have one opportunity within one year to retake the examination at a reduced rate. C-NET will mail a re-examination application to those applicants who do not pass.

Preparing to take the Examination

Physical and Emotional Preparation

- Think positively.
- Study and prepare for the examination so that you feel confident.
- Moderate anxiety is normal and may be helpful - you may be more mentally and physically alert.
- Use as much of the allotted time as you need to think through and answer the questions.
- Get a good night's sleep.
- Eat a good meal with protein before the examination.
- Gather all the materials you need to take the test the night before the exam (e.g., photo ID, directions to testing center, etc.).
- Allow plenty of time and arrive early.
- If you are easily distracted by other test takers, ask for a seat where you will be less likely to notice the other test takers.
- Reference books, notes, or other study materials may not be brought into the examination room.

Tips on Answering Examination Questions

- Read the questions carefully and focus on key words in the question such as "first," "most likely," "most important," "best."
- As you read the question, anticipate the correct answer.
- Read each of the four choices carefully. Even if the first option sounds correct, read all options before choosing the answer.
- Do not "read into" the question. Answer the question based only on the information presented, even if you think the answer is too obvious or too easy.
- Do not spend too much time on any one question. Make a note of the questions of which you are uncertain and return to them later if you have time.
- There is no penalty for guessing, so you should make an educated guess if you are not sure of an answer.

Resources

NNCC:

www.nncc-exam.org
(888) 884-6622
Like us on Facebook
Follow us on LinkedIn

CNET:

www.cnetnurse.com
(800) 463-0786

NNCC Policies

Statement of Nondiscrimination

It is the policy of NNCC that no individual shall be excluded from the opportunity to participate in the NNCC certification programs on the basis of race, ethnicity, national origin, religion, marital status, sexual orientation, gender identity, age, or disability.

Denial, Suspension, or Revocation of Certification/Recertification

The occurrence of any of the following actions will result in the denial, suspension, or revocation of the certification:

- Failure to meet all eligibility criteria for certification/recertification
- Falsification of the NNCC application
- Falsification of any materials or information requested by the NNCC
- Any restrictions such as revocation, suspension, probation, or other sanctions by a nursing or other regulatory authority
- Misrepresentation of certification status
- Cheating on the examination
- Applicable state and/or federal sanctions
- Failure to meet continuing education criteria
- Failure to meet work experience requirements

Falsifying any materials, including continuing education requirements for certification or recertification (number of contact hours or dates), may lead to denial or permanent loss of NNCC certification.

The NNCC reserves the right to investigate all suspected/reported violations and, if appropriate, notify the certificant's employer/State Board of Nursing or other regulatory authority. The certificant will be notified in writing of NNCC's decision(s)/action(s).

Appeal Process

An applicant who has been denied certification, failed an examination, or had certification revoked has the right of appeal. This appeal must be submitted in writing to the President of the NNCC within thirty (30) days of notification. The appeal shall state specific reasons why the applicant feels entitled to certification. At the applicant's request, the President shall appoint a committee of three (3) NNCC Commissioners who will meet with the applicant and make recommendations to the NNCC. The committee will meet in conjunction with a regularly scheduled NNCC meeting. The applicant will be responsible for his/her own expenses. The final decision of the NNCC will be communicated in writing to the applicant within thirty (30) days following the NNCC meeting. Failure of the applicant to request an appeal or appear before the committee shall constitute a waiver of the applicant's right of appeal.

Content of the CNN-NP Examination

The CNN-NP examination is designed to test the knowledge needed to provide safe care to patients by NPs practicing in nephrology. There are two dimensions in the test blueprint, Content and Objectives. Content include five sections: (A) Acute Kidney Injury, (B) Stages 1 and 2 Chronic Kidney Disease (CKD), (C) Stage 3 CKD, (D) Stages 4 and 5 CKD, and (E) Kidney Replacement Therapies. Specific activities are tested in each Content area. The exam also includes five Objectives areas: (1) Assess and diagnose pathologic processes and complications, (2) prescribe interventions, (3) provide resources to educate patient, family, etc., (4) facilitate an inter-disciplinary approach, and (5) develop a holistic plan of care.

Each question on the test fits into one Content area and one Objective area. This is shown on the blueprint grid (see page 7). The entire test is mapped out in this manner to guide the item writers when they are developing the test.

Content Areas:

A. Acute Kidney Injury (6-8%)

Questions in the Acute Kidney Injury area deal with the NP's ability to care for patients with acute kidney injury. This area is a small portion of the test and makes up only 6-8% of the test content. Examples of the types of questions in this area include:

1. Determining the need for initiation of acute kidney replacement therapy.
2. Collaborating with hospital staff to manage kidney replacement therapies.

B. Stages 1 & 2 CKD (4-6%)

Questions in this area deal with patients in Stages 1 and 2 CKD. This is also a very small portion of the test making up only 4-6% of the test content. Examples of questions in this area include:

1. Determining patient's estimated glomerular filtration rate (eGFR).
2. Teaching patient and significant others about multisystem effects of kidney disease.

C. Stage 3 CKD (11-13%)

The questions in this area address the NP's knowledge of Stage 3 CKD. It is a larger percentage of the exam than the two previous sections and makes up 11-13% of the test content. Examples of the type of questions in this area include:

1. Evaluating and treating progression of CKD.
2. Diagnosing and treating complications of CKD.
3. Evaluating and treating patient with risk factors for/presence of cardiovascular disease.
4. Prescribing pharmacological agents based on disease etiology and level of kidney function.

D. Stages 4 & 5 CKD (20-22%)

The questions in this area are restricted to patients not yet on kidney replacement therapy. This portion makes up 20-22% of the test content. Examples of the types of questions in this area include:

1. Informing patient and significant others about treatment options for CKD.
2. Adjusting pharmacological agents based on patient's response and level of kidney function
3. Teaching patient, significant others, and other health professionals about vein preservation.
4. Intervening to preserve residual kidney function.
5. Referring patient for dialysis access placement.

E. Kidney Replacement Therapies (54-56%)

This portion is the greatest percentage of the exam at 54-56% of questions. It includes all types of kidney replacement therapies. The majority of questions are about patients on hemodialysis. The number of questions on each area are listed above on the blueprint. Examples of questions are listed below

1. Interpreting laboratory/diagnostic study findings and ordering interventions as needed.
2. Diagnosing and treating complications of dialysis therapy.
3. Evaluating and treating patient's fluid abnormalities.
4. Ordering changes in dialysis prescription.
5. Evaluating dialysis access and ordering interventions as needed.
6. Evaluating and treating patient for complications post transplantation.

The complete list of activities can be found on the NNCC website (www.nncc-exam.org) in the CNN-NP section. Click on The Exam, then on Exam Specifications.

Test Specifications for the CNN-NP Certification Examination

Objectives:

1. Assess and diagnose pathologic processes and complications that occur in kidney disease. **(38-40%)**
2. Prescribe interventions, including evidence-based treatments, therapies, and procedures consistent with comprehensive care needs. **(43-45%)**
3. Evaluate, select and/or design strategies/resources to educate patient, family, other health professionals, and the public. **(8-10%)**
 - Pharmacology (21-23%)
 - Other (21-23%)
4. Facilitate an interdisciplinary process with other members of the healthcare team. **(3-5%)**
5. Ensure the development of a holistic plan of care that reflects an individual's values and beliefs. **(3-5%)**

Distribution of 175 Question in the CNN-NP Exam

(revised 4/2018, implemented 7/2019)

Objective Content Area	1. Assess & diagnose pathologic processes & complications	2. Prescribe interventions (Pharm: 21-23% Other: 21-23%)	3. Resources to educate patient, family, etc.	4. Facilitate an interdisciplinary approach	5. Develop a holistic plan of care	Total
A. Acute Kidney Injury	4-6	5-7	1-3	0-1	0-1	11-13 (6-8%)
B. Stages 1 & 2 CKD & General Nephrology	2-4	3-5	1-3	0-1	0-1	8-10 (4-6%)
C. Stage 3 CKD	7-9	8-10	1-3	0-2	0-2	20-22 (11-13%)
D. Stages 4 & 5 CKD	13-15	15-17	2-4	0-2	0-2	36-38 (20-22%)
E. Kidney Replacement Therapies	36-38	42-44	8-10	3-5	3-5	95-97 (54-56%)
Total	67-69 (38-40%)	76-78 (43-45%)	15-17 (8-10%)	6-8 (3-5%)	6-8 (3-5%)	175

Types of Questions on the CNN-NP Examination

Several different types of questions appear on the CNN-NP examination. Some questions require a basic recall of knowledge, while others test the NP's ability to comprehend a concept. However, most of the questions ask the NP to apply knowledge in a clinical situation. The CNN-NP test blueprint specifies the percent of each type of question in the test. Examples of each of these types of questions appear below with the correct answer marked with a checkmark (✓).

A. Recall of Knowledge (10%)

Test questions at the knowledge level ask the NP to remember specific facts, common terms, basic concepts, and principles. Definitions of terms are examples of recall items.

1. In patients on hemodialysis who have **refractory** secondary hyperparathyroidism, clinical indications for a parathyroidectomy include
 1. intact PTH: 700 pg/mL.
 2. Hypocalcemia.
 3. Hypophosphatemia.
 4. Calciphylaxis. ✓

B. Comprehension (25%)

Test questions at the comprehension level go beyond basic recall to determine the NP's deeper understanding of a concept. Examples of words used to describe comprehension might include interpret, compare, contrast, explain, estimate, and translate.

2. A patient who resides in an extended care facility (ECF) was started on chronic maintenance hemodialysis two months ago and has been receiving doxercalciferol (Hectorol) 1.5 mcg intravenously three times weekly during treatment. The patient's monthly laboratory results show an increase in serum calcium from 9.4 mg/dL to 10.3 mg/dL. The NP should be aware that which of the following medications, if administered at the ECF, would contribute to hypercalcemia?
 1. Sevelamer (Renvela) 800 mg PO with meals.
 2. Cinacalcet (Sensipar) 30 mg PO every evening.
 3. Calcitriol (Rocaltrol) 0.5 mcg PO daily. ✓
 4. Alendronate (Fosamax) 35 mg PO weekly.

C. Application of Knowledge (65%)

Test questions at the application level ask the NP to apply previously learned facts and concepts to new situations and to solve problems. These questions present an on-the-job situation and ask what problem is occurring or what action to take in the situation.

3. A patient has been on maintenance hemodialysis for eight months and is receiving the following medications:

Lanthanum carbonate (Fosrenol) 1000 mg PO with meals
Ergocalciferol/vitamin D2 50,000 units PO weekly
Paricalcitol (Zemplar) 10.5 mcg IV three times weekly on dialysis

The patient's recent laboratory results are as follow:

Calcium: 10.9 mg/dL
Phosphorus: 4.3 mg/dL
PTH: 20.1 pg/dL
(25-OH) vitamin D: 32 ng/mL

The NP should take which of the following actions?

1. Change the patient to a 2.5 calcium bath.
2. Hold the intravenous vitamin D analog. ✓
3. Decrease the patient's binder dose.
4. Increase the oral vitamin D.

CNN-NP Certification Preparation Test

This Preparation Test has been developed to give you experience with the type of questions that are on the CNN-NP examination. None of these questions will appear on the actual exam. On page 13, the correct answers and rationales for each of the questions are given. Compare your answers with the correct answers.

1. A patient was referred to the nephrology practice because of an acute rise in serum creatinine. One month ago, his creatinine was 1.3 mg/dL and today it is 4.0 mg/dL. To help establish a diagnosis, the NP should determine if the patient was prescribed which type of medication during the past month?
 1. A calcium channel blocker.
 2. An angiotensin-converting enzyme inhibitor.
 3. A macrolide antibiotic.
 4. A third-generation cephalosporin.
2. A patient who is on hemodialysis has been given instructions about the phosphorus content of foods. The instructions have been effective if he selects/identifies which of these foods as **highest** in phosphorus?
 1. One cup of green peas.
 2. 12 ounces of ginger ale.
 3. One baked medium sweet potato.
 4. One ounce of Velveeta cheese.
3. On the third postoperative day following kidney transplant, a patient begins to drain large amounts of clear fluid through the incision. The NP should order a fluid sample to be tested for increased
 1. glucose.
 2. creatinine.
 3. leukocytes.
 4. protein.
4. Which of these medications is **CONTRAINDICATED** for patients with diabetes mellitus and CKD Stages 4 and 5?
 1. Losartan (Cozaar).
 2. Glipizide (Glucotrol).
 3. Amlodipine (Norvasc).
 4. Metformin (Glucophage).
5. Urinalysis findings consistent with prerenal acute kidney injury (AKI) include
 1. specific gravity < 1.010.
 2. sodium > 30 mEq/L.
 3. osmolality < 350 mOsm/L.
 4. fractional excretion of sodium < 1.
6. A hemodialysis patient presents to the emergency department complaining of weakness and generally not feeling well. The cardiac monitor shows peaked T waves and an irregular rhythm. A stat serum potassium reveals a level of 7.0 mEq/L. The NP should be aware that cardiotoxicity is **most** quickly and effectively treated with
 1. intravenous calcium gluconate.
 2. oral disodium polystyrene disulfonate (Kayexalate).
 3. subcutaneous regular insulin.
 4. intravenous amiodarone (Cordane).
7. A patient who has CKD Stage 4 develops pneumonia. Which of the following antibiotics is the **most** nephrotoxic?
 1. Ceftazidime (Fortaz).
 2. Tobramycin sulfate (Tobrex).
 3. Levofloxacin (Levaquin).
 4. Azithromycin (Zithromax).

Linda McGivern, 67 years old, has been referred for management of CKD related to diabetes mellitus (DM). Her estimated glomerular filtration rate is 37 ml/min/1.73 m².

8. Ms. McGivern's lipid profile reveals elevated low density lipoproteins (LDL). To treat her dyslipidemia at this time, the **most** appropriate approach includes therapeutic lifestyle changes and a low dose
1. statin.
 2. fibrate.
 3. niacin.
 4. omega-3 fatty acid.
9. Ms. McGivern has 3+ ankle edema. Which of these classifications of diuretic would be **most** appropriate for treating her edema?
1. Thiazide.
 2. Loop.
 3. Carbonic anhydrase inhibitor.
 4. Potassium-sparing.

* * *

Questions 10-22 are individual items.

10. Which of these medications should be **AVOIDED** in a patient who has a serum phosphorus of 6.6 mg/dL, a total corrected serum calcium of 10.3 mg/dL, and a magnesium of 1.2 mEq/L?
1. Sevelamer carbonate (Renvela).
 2. Lanthanum carbonate (Fosrenol).
 3. Aluminum hydroxide, magnesium hydroxide, and simethicone (Mylanta).
 4. Calcium acetate (PhosLo).

11. A patient who is receiving hemodialysis treatments but does not have adequate iron replacement is at risk for which type of anemia?
1. Microcytic, hypochromic.
 2. Normocytic, hypochromic.
 3. Normocytic, normochromic.
 4. Microcytic, normochromic.
12. A patient on hemodialysis has been on a stable dose of an erythropoietin-stimulating agent (ESA) and low dose maintenance iron for four months with hemoglobin within target range. This month, the patient's laboratory results reveal a decrease in hemoglobin from 10.8 to 10.0 g/dL and an increase in ferritin from 480 to 900 ng/mL. Which of these actions should the NP take **first**?
1. Increase the patient's ESA dosage.
 2. Increase the patient's iron dosage.
 3. Evaluate the patient for inflammation.
 4. Evaluate the patient for gastrointestinal bleeding.
13. The NP should be aware that the pathogen **most** commonly associated with hemodialysis catheter access infections is
1. *Streptococcus epidermidis*.
 2. *Streptococcus viridans*.
 3. *Staphylococcus aureus*.
 4. coagulase-negative *Staphylococcus*.

14. In functional iron deficiency, the NP would expect to find
1. a decrease in albumin.
 2. a decrease in ferritin.
 3. an increase in hemoglobin with an ESA.
 4. an increase in hemoglobin with iron therapy.

15. The **initial** treatment of a gram-positive exit-site infection in a patient on peritoneal dialysis is
1. rifampin (Rifadin) 600 mg PO qid.
 2. azithromycin (Zithromax) 250 mg PO bid.
 3. dicloxacillin (Dynapen) 250 mg PO qid.
 4. ciprofloxacin hydrochloride (Cipro) 250 mg PO bid.
16. A patient with CKD Stage 4 has the following laboratory values:
- iPTH: 78 pg/mL
 Calcium: 8.9 mg/dL
 Phosphorus: 4.3 mg/dL
 25-hydroxyvitamin D level: 24 ng/mL
- The NP should prescribe which of these medications **initially**?
1. Calcitriol (Rocaltrol).
 2. Paricalcitol (Zemplar).
 3. Cinacalcet hydrochloride (Sensipar).
 4. Ergocalciferol (vitamin D2).
17. Continuous renal replacement therapy (CRRT) is **most** likely to be used in which of these conditions?
1. Septic shock.
 2. Hepatic encephalopathy.
 3. Amphetamine-related drug overdose.
 4. Compartment syndrome.
18. The NP is following a dialysis patient in an extended care facility (ECF). The ECF staff ask the NP to review their bowel program for this patient. The NP should instruct the staff to **AVOID** the routine use of
1. glycerin suppositories.
 2. Fleets enemas.
 3. bisacodyl (Dulcolax) suppositories.
 4. saline enemas.
19. The staff in a primary care provider's office has become increasingly frustrated with CKD patients refusing to have bloodwork drawn from certain veins. Which of these actions by the NP would be **best**?
1. Invite the office staff to the HD unit to see how AV accesses are used.
 2. Ask the vascular surgeon to give a presentation on AV access placement.
 3. Arrange an interactive session with the office staff to discuss vein preservation.
 4. Demonstrate vein location and diameter using vein mapping films.
20. Which of the following primary kidney diseases is **most** likely to recur posttransplant?
1. Alport's syndrome.
 2. Fanconi syndrome.
 3. Membranoproliferative glomerulonephritis.
 4. Autosomal-dominant polycystic kidney disease.
21. A patient who has hypertension has been educated on lowering her sodium intake. She frequently goes out for breakfast on Sunday mornings. Which of these breakfast selections would be **best**?
1. Two pancakes with butter and syrup
 2. Biscuit with egg and cheese.
 3. Biscuit with sausage gravy.
 4. Two slices of French toast with butter and powdered sugar.
22. When evaluating a patient with CKD Stage 5 for transplant, it is **most** important for the interdisciplinary team to consider the patient's
1. cardiovascular status.
 2. functional status.
 3. nutritional status.
 4. antibody status.

The NP is teaching the dialysis staff about dialysis-related complications.

23. Which of the following is an initial symptom of acute hemolysis?
1. Back pain.
 2. Diaphoresis.
 3. Confusion.
 4. Urticaria.
24. When hemolysis is suspected, immediate actions should include stopping dialysis and **NOT** reinfusing blood due to the risk of
1. sepsis.
 2. hyperkalemia.
 3. air embolism.
 4. dialysis reaction.

Questions 25-30 are individual items.

25. Outpatient care of a patient who has dialysis-dependent AKI includes
1. aggressive fluid removal to prevent volume overload.
 2. monthly monitoring of kidney function.
 3. prevention of hypotension during dialysis treatments.
 4. discontinuation of dialysis when creatinine reaches 4.0 mg/dL.
30. A patient who is on hemodialysis has Fabry's disease. The **most** common symptom of Fabry's disease is
1. painful paresthesias.
 2. uncontrolled hypertension.
 3. sensorineural deafness.
 4. pulmonary hemorrhage.

26. A 40-year-old male on hemodialysis tells the NP he feels nauseated and nervous, cannot sleep, and has a diminished appetite. On further assessment, he admits he stopped taking all his medications three days ago. His symptoms are **most** likely caused by stopping which of these medications?
1. Amlodipine (Norvasc).
 2. Bupropion hydrochloride (Wellbutrin).
 3. Lisinopril (Zestril).
 4. Paroxetine hydrochloride (Paxil).
27. A patient's laboratory results for hepatitis B include:
- Hepatitis B surface antigen (HBsAg) - negative
Hepatitis B core antibody (antiHBC) - positive
Hepatitis B surface antibody (antiHBs) - positive
- The results indicate the patient has had hepatitis B in the past and now is
1. in need of vaccination.
 2. immune due to natural infection.
 3. potentially infectious.
 4. a chronic carrier.

28. A 65-year-old female is starting hemodialysis at the outpatient unit. During the admission process, the NP asks the patient if she has a copy of her advance directives. The patient replies, "No, I'm not ready to die." Which of these responses by the NP would be best?
1. "We will be obligated to do everything possible unless you tell us otherwise."
 2. "Do you want your family to make these decisions for you?"
 3. "This is an opportunity for us to discuss your wishes and goals."
 4. "Are you aware the mortality rate for patients on hemodialysis is twenty percent annually?"
29. Treatment for metabolic acidosis in patients with CKD should be initiated when the total CO₂/HCO₃ level falls below
1. 22 mEq/L.
 2. 26 mEq/L.
 3. 30 mEq/L.
 4. 34 mEq/L.

CNN-NP Certification Preparation Test Answers

Below, you will find the correct answer to each of the Preparation Test questions, as well as a rationale explaining the correct answer. Also indicated is the blueprint area that each question falls under, and a reference where the correct answer can be found. The references used include:

- Centers for Disease Control and Prevention. www.cdc.gov
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- Feehally, J., Floege, J., Tonelli, M., & Johnson, R.J. (2019). *Comprehensive Clinical Nephrology*, 6th ed., Philadelphia: Saunders/Elsevier.
- Gilbert, S.J., Weiner, D.E., et al. (2017). *National Kidney Foundation's Primer on Kidney Diseases*, 7th ed. Philadelphia: Elsevier/Saunders.
- Guest, S. (2014). *Handbook of Peritoneal Dialysis*. 2nd ed. Middletown, DE: Author.
- Ikizler, T.A. & Mitch, W.E. (2018). *Handbook of Nutrition and the Kidney*. Philadelphia: Wolters Kluwer.
- Kam Tao Li, P., et al. (2016). *ISPD Guidelines/Recommendations. Peritonitis Recommendations: 2016 Update on Prevention and Treatment. Peritoneal Dialysis International*, 36(5), 481-508.
- Kidney Disease Improving Global Outcomes (KDIGO). *Clinical Practice Guidelines*. www.kdigo.org.
- Lerma, E.V. & Weir, M.P. (2017). *Heinrich's Principles and Practices of Dialysis*, 5th ed. Philadelphia: Wolters Kluwer/Lippincott Williams, & Wilkins.
- Lexi-Comp (2017). *Drug Information Handbook for Advanced Practice Nursing*. 17th ed. Hudson, OH: Lexi-Comp, Inc.
- National Kidney Foundation. *KDOQI Clinical practice Guidelines*. www.kidney.org.
- UpToDate. Waltham, MA: Wolters Kluwer.

1. **Answer: 2**

Blueprint Area: Acute Kidney Injury - Prescribe interventions

The Acute Kidney Injury Network (AKIN) defines acute kidney injury as an increase in serum creatinine by ≥ 0.3 mg/dL within 48 hours or an increase of ≥ 1.5 times baseline, which is known or presumed to have occurred within the prior 7 days. Medications causing AKI include ACE inhibitors. After initiating therapy with an ACE inhibitor, creatinine should be monitored. A change in therapy should be considered if the rise in creatinine is greater than 30% from baseline.

Core Curriculum, Module 6, p. 36, 122, Module 2, p. 308; *UpToDate*, *Drugs that elevate the serum creatinine*, Sept. 14, 2018

2. **Answer: 4**

Blueprint Area: Kidney Replacement Therapies - Resources to educate patient, family, etc.

In general, dairy products and processed foods are higher in phosphorus. The amount of phosphorus in several common foods is noted below:

green peas - 123 mg

12 ounces of ginger ale - 0 mg

1 baked medium sweet potato - 77 mg

1 ounce of Velveeta cheese - 242 mg

Contemporary Nephrology Nursing, p. 420

3. **Answer: 2**

Blueprint Area: Kidney Replacement Therapies - Prescribe interventions

A postoperative complication in approximately 1-3% of transplant recipients is urine leak. The fluid reveals a high creatinine that exceeds the plasma creatinine.

Core Curriculum, Module 6, p. 61; *Comprehensive Clinical Nephrology*, p. 1180; *Handbook of Kidney Transplantation*, p. 251

4. **Answer: 4**

Blueprint Area: Stages 4 & 5 CKD - Prescribe interventions

Metformin (Glucophage), is contraindicated when the eGFR is < 30 ml/min/1.73 m².

Drug Information Handbook for Advanced Practice Nursing, p. 1461

5. **Answer:** 4
Blueprint Area: Acute Kidney Injury - Assess & diagnose pathologic processes & complications
In prerenal AKI there is decreased renal perfusion. The intact renal parenchyma tries to conserve as much sodium as possible to restore intravascular fluid volume and as a result, renal perfusion. The urine is very concentrated (>500 mOsm/L) and very little sodium is excreted.
Core Curriculum, Module 6, p. 122
6. **Answer:** 1
Blueprint Area: Kidney Replacement Therapies - Prescribe interventions
IV calcium gluconate is indicated in the treatment of hyperkalemia characterized by cardiac arrhythmia. Calcium antagonizes the effects of potassium and is effective within 1-3 minutes.
Core Curriculum, Module 6, p. 141; NKF Primer on Kidney Diseases, p. 104
7. **Answer:** 2
Blueprint Area: CKD Stages 4 & 5 - Prescribe interventions
Aminoglycoside nephrotoxicity occurs in up to 20% of individuals receiving these antibiotics even with careful dosing and blood monitoring. Toxicity is due to direct tubular toxicity and is generally non-oliguric. Predisposing factors include total cumulative dose and presence of CKD.
Core Curriculum, Module 6, p. 30; Handbook of CKD Management, p. 384; NKF Primer on Kidney Diseases, p. 340
8. **Answer:** 1
Blueprint Area: Stage 3 CKD - Prescribe interventions
Statins are indicated for pharmacologic therapy for dyslipidemia and are the drugs of choice to lower LDL, thus reducing cardiovascular risks in patients with CKD and DM. Fibrates, niacin, and omega-3 fatty acids are more appropriate to lower triglycerides.
Core Curriculum, Module 6, p. 38, Module 2, pp. 178-179, p. 314; KDIGO 2013 Clinical Practice Guideline for Lipid Management in Chronic Kidney Disease, Chapter 2.1.1, kdigo.org/home/guidelines/lipids; NKF Primer on Kidney Diseases, p. 262
9. **Answer:** 2
Blueprint Area: Stage 3 CKD - Prescribe interventions
The tubules remain responsive to loop diuretics at significantly lower GFRs than other classes of diuretics and inhibit the reabsorption of 25% of filtered sodium normally occurring in the thick ascending limb. Thiazide diuretics become less effective as the GFR reaches <30 mL/min/1.73 m². Potassium-sparing diuretics include significant risks for hyperkalemia. Carbonic anhydrase inhibitors are rarely used.
Core Curriculum, Module 2, p. 315, Module 6, p. 37; Contemporary Nephrology Nursing, p. 695
10. **Answer:** 4
Blueprint Area: Kidney Replacement Therapies - Prescribe interventions
Calcium-based binders should be avoided in individuals with hypercalcemia due to the increased risk of cardiovascular disease related to medial arterial wall calcification.
Core Curriculum, Module 2, p. 319, Module 6, p. 42; KDIGO Guideline for CKD-MBD (2017) Chapter 4.1 - 4.1.5/4.1.6 kdigo.org/home/mineral-bone-disorder/
11. **Answer:** 1
Blueprint Area: Kidney Replacement Therapies - Assess & diagnose pathologic processes & complications
Anemia of iron deficiency is characterized by red blood cells that are smaller and paler due to the need for iron to make hemoglobin.
Core Curriculum, Module 2, p. 130; Contemporary Nephrology Nursing, pp. 389-390; Comprehensive Clinical Nephrology p. 960
12. **Answer:** 3
Blueprint Area: Kidney Replacement Therapies - Assess & diagnose pathologic processes & complications
When ferritin levels are above 500 ng/mL, the patient should be evaluated for causes of elevated ferritin. Ferritin is an acute phase reactant and this may be an indication of inflammation.
Core Curriculum, Module 6, p. 40; Contemporary Nephrology Nursing, p. 390; NKF Primer on Kidney Diseases, p. 523
13. **Answer:** 3
Blueprint Area: Kidney Replacement Therapies - Assess & diagnose pathologic processes & complications
Staphylococcus aureus is the leading cause of catheter exit site infection and bacteremia in hemodialysis patients. Bacteremia and tunnel infections are the leading causes of catheter loss.
Core Curriculum, Module 2, pp. 334-335; Contemporary Nephrology Nursing, pp. 372-373

14. **Answer:** 4
Blueprint Area: Stages 4 & 5 CKD - Assess & diagnose pathologic processes & complications
Iron deficiency may occur despite normal iron stores. This phenomenon has been termed "functional iron deficiency" and may be noted clinically by a low transferrin saturation despite a normal or elevated serum ferritin level.
Core Curriculum, Module 6, p. 40; Handbook of Chronic Kidney Disease Management, pp. 369-370
15. **Answer:** 3
Blueprint Area: Kidney Replacement Therapies - Prescribe interventions
An exit site infection should be treated with increased local care and oral antibiotics. Empiric oral antibiotics should be started to cover gram-positive skin organisms. An oral antistaphylococcal penicillin or first generation cephalosporin is typically recommended.
ISPD Guidelines/Recommendations. Peritonitis Recommendations: 2017 Update on Prevention and Treatment, p. 147; Handbook of Peritoneal Dialysis, pp. 120-121; Comprehensive Clinical Nephrology, p. 1119.
16. **Answer:** 4
Blueprint Area: Stages 4 & 5 CKD - Prescribe interventions
In patients with CKD Stages 3 and 4, supplementation with vitamin D2 (ergocalciferol) should be initiated if the serum level of 25-hydroxyvitamin D is < 30 ng/mL. A trial of vitamin D2 should be done before treatment with active vitamin D.
Core Curriculum, Module 6, p. 44; Handbook of Chronic Kidney Disease Management, p. 136
17. **Answer:** 1
Blueprint Area: Kidney Replacement Therapies - Assess & diagnose pathologic processes & complications
Septic shock is one of the most common etiologies of AKI and is generally associated with hemodynamic instability. CRRT is indicated for hemodynamically unstable individuals requiring kidney replacement therapy.
Core Curriculum, Module 4, p. 168; Handbook of Dialysis, p. 300; Contemporary Nephrology Nursing, p. 653
18. **Answer:** 2
Blueprint Area: Kidney Replacement Therapies - Prescribe interventions
Fleets enemas (sodium phosphate) are avoided due to the risk of hyperphosphatemia from phosphorus absorbed through gastrointestinal mucosa. A 118 mL Fleets enema contains phosphorus and over 4.4 gm of sodium.
Handbook of CKD Management, p. 388; NKF Primer on Kidney Diseases, p. 116
19. **Answer:** 3
Blueprint Area: Stages 4 & 5 CKD - Resources to educate patient, family, etc.
Preservation of peripheral veins is important in all individuals with CKD to facilitate future vascular access placement. Veins on the dorsum of the hand should be used for bloodwork venipuncture.
Core Curriculum, Module 3, p. 172, Module 6, p. 47; Handbook of CKD Management, p. 530; Contemporary Nephrology Nursing, p. 329
20. **Answer:** 3
Blueprint Area: Kidney Replacement Therapies - Assess & diagnose pathologic processes & complications
Membranoproliferative glomerulonephritis recurs in of transplanted patients. Genetically transmitted diseases do not recur in a transplanted kidney.
Core Curriculum, Module 6, p. 58, Module 3, p. 10; Kidney Transplantation: Principles and Practice, p. 419
21. **Answer:** 4
Blueprint Area: Stages 1 & 2 CKD - Prescribe interventions
Sodium levels are especially high in canned foods, packaged "helper" foods, pickled foods, and preserved meats, such as cold cuts, sausages, and hot dogs. The levels of sodium in the breakfasts listed in the question are:
Two pancakes with butter and syrup. 1104 mg Na+
Biscuit with egg and cheese. 804 mg Na+
Biscuit with sausage gravy. 3,755 mg Na+
Two slices of French toast with butter and powdered sugar. 513 mg Na+
Bowes & Church's Food Values of Portions Commonly Used, p. 58, 61, 65

22. **Answer:** 1
Blueprint Area: Kidney Replacement Therapies - Facilitate an interdisciplinary approach
A detailed cardiovascular history and evaluation is needed due to the increased incidence of cardiovascular disease in patients with CKD Stage 5. Cardiovascular disease is the leading cause of morbidity and mortality in transplant patients and is a significant limitation of graft survival.
Core Curriculum, Module 3, p. 9, 11, Module 6, p. 58; *Handbook of Kidney Transplantation*, p. 215
23. **Answer:** 1
Blueprint Area: Kidney Replacement Therapies - Assess & diagnose pathologic processes & complications
The initial symptoms of hemolysis include back, chest, or abdominal pain with possible crescendo of pain, especially in the back. Other findings include dyspnea, hypotension, localized burning and pain in the vascular access return site. Blood in the venous line may have a port-wine, cola-colored, or cherry-red appearance.
Core Curriculum, Module 3, p. 138; *Handbook of dialysis*, pp. 231-232; *Contemporary Nephrology Nursing*, p. 187
24. **Answer:** 2
Blueprint Area: Kidney Replacement Therapies - Prescribe interventions
The process of hemolysis causes the release of intracellular potassium into the circulation. The blood pump should be stopped and bloodlines clamped to prevent the potassium-rich blood from being reinfused.
Core Curriculum, Module 3, p. 138; *Handbook of Dialysis*, p. 232; *Contemporary Nephrology Nursing*, p. 197
25. **Answer:** 3
Blueprint Area: Acute Kidney Injury - Prescribe interventions
In the patient who has AKI, intradialytic hypotension from aggressive fluid removal can promote further kidney injury. Hypotension/hypoperfusion risks blunting the resolution of the AKI.
Core Curriculum, Module 6, p. 129; *Contemporary Nephrology Nursing*, p. 662
26. **Answer:** 1
Blueprint Area: Kidney Replacement Therapies – Assess & diagnose pathologic processes & complications
Painful paresthesias are the most common symptom in individuals with CKD Stage 5. Although a small number of individuals with Fabry's disease experience CKD Stage 5, it is becoming more common and should be considered in the differential diagnosis. Enzyme replacement therapy is available and effective in reducing pain in patients who have Fabry's disease.
NKF Primer on Kidney Diseases, p. 398; *Comprehensive Clinical Nephrology*, pp. 569-570.
27. **Answer:** 4
Blueprint Area: Kidney Replacement Therapies - Assess & diagnose pathologic processes & complications
When Paxil is being discontinued, gradually taper dose to monitor for symptoms of discontinuation syndrome (e.g., dizziness, irritability, agitation, confusion, paresthesia). If intolerable symptoms occur, then resume the previous dose with a more gradual taper.
Drug Information Handbook for Advanced Practice Nursing, p. 1744
28. **Answer:** 2
Blueprint Area: Stage 3 CKD - Assess & diagnose pathologic processes & complications
Positive core and surface antibodies indicate immunity through past infection. A negative surface antigen indicates no current infection.
Core Curriculum, Module 2, pp. 349-350; *Contemporary Nephrology Nursing*, p. 878; CDC Guidelines- Interpretation of Hepatitis B Serologic Test Results- www.cdc.gov/hepatitis
29. **Answer:** 3
Blueprint Area: Kidney Replacement Therapies - Develop a holistic plan of care
Talking with patients about advanced directives is part of meaningful discussion, informed consent, and self-determination regarding treatment options and preferences.
Core Curriculum, Module 6, p. 9; *Contemporary Nephrology Nursing*, pp. 616-617
30. **Answer:** 1
Blueprint Area: Stages 4 & 5 CKD - Prescribe interventions
Individuals with CKD have a chronic metabolic acidosis. Treatment is indicated when the CO₂ falls below 22 mEq/L in order to prevent the complications of acidosis, including progression of kidney disease, bone disease, catabolism, and endocrine dysfunction.
Core Curriculum, Module 6, p. 31; *Handbook of CKD Management*, pp. 179-180



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