

CD-LPN[®]

CERTIFIED DIALYSIS - LICENSED PRACTICAL NURSE

CD-LVN[®]

CERTIFIED DIALYSIS - LICENSED VOCATIONAL NURSE

Certification Preparation Guide

nncc[®]

Nephrology Nusing
Certification Commission

CD-LPN/LVN 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

The Nephrology Nursing Certification Commission (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

The Nephrology Nursing Certification 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:

- Certification testing for specialty nursing practice
- Preadmission testing for RN and LPN/LVN schools of nursing
- Clinical Judgement Series of tests for nursing practice settings
- Test construction workshops for nurse educators

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)

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

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.

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.

Clinical/Technical Examination Board

The Clinical/Technical Exam Board is made up of representatives from the CCHT, CCHT-A, and CD-LPN/LVN Testing Committees. The purpose of the Exam Board is to establish, review, and update eligibility criteria relevant to certification. 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 job analysis role delineation survey tool and data analysis, updates to the examination blueprint, and completes audits of certification and recertification applications for quality assurance.

CD-LPN/LVN Test Committee

Members of the CD-LPN/LVN Test Committee have dialysis expertise, meet education requirements, and must be NNCC certified. They are responsible for writing and reviewing questions relevant to the examination. Along with the testing agency representative, 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 LPN/LVNs. 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 CD-LPN/LVN examination is based on a job analysis survey of LPN/LVNs that identifies the key tasks/activities performed by entry-level dialysis LPN/LVNs. A national task force is brought together to plan the survey content. This task force includes LPN/LVNs, as well as clinical educators and clinical managers of LPN/LVNs. Following data collection, the task force reviews the survey results and makes recommendations for the CD-LPN/LVN test specifications. Most importantly, a job analysis is performed every five years to be sure the test reflects current practice and is kept up to date.

The group that oversees CD-LPN/LVN test development is the NNCC Clinical/Technical Examination Board, which is made up of technicians and nurses who work with technicians. There is also a CD-LPN/LVN Test Committee that writes the actual test questions. Item writers, who are certified LPN/LVNs from a variety of geographic and practice settings, write test questions to meet the CD-LPN/LVN blueprint requirements. Members of both the Clinical/Technical Board and the Test Committee are considered "content experts" concerning the knowledge and skills needed by dialysis CD-LPN/LVNs for safe practice.

Each question on the test can be linked directly to the tasks/activities in the job 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 supported, using the *Core Curriculum for Nephrology Nursing*, the regulations in the *CMS Conditions for Coverage for End-Stage Renal Disease Facilities*, and other references.

The test consists of 150 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 LPN/LVNs who serve as subject matter experts (SMEs). Both experienced and newly certified LPN/LVNs 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 74% correct is required to pass the CD-LPN/LVN 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 knowledge and competence in a specialty and is an essential component of specialty nursing practice. 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. Certification has been linked to 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 CD-LPN/LVN?

To be eligible to sit for the CD-LPN/LVN Exam, you must:

- Hold a full and unrestricted license as a licensed practical nurse or licensed vocational nurse in the United States, or its territories
- Two (2) years and 2,000 hours as an LPN or LVN working with patients who require or may require dialysis within the previous 2 years.
- 15 contact hours of continuing education relevant to the care of patients who require or may require dialysis, within the previous two years. *

* Designated signatures are required

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

How do I apply for the CD-LPN/LVN 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 clear copies of contact hour certificates to total 15 contact hours specific to nephrology.
3. Attach a copy or verification of your current LPN/LVN license with the expiration date clearly visible, or a letter or printout from your state board of nursing verifying licensure with license number and date of expiration.
4. Have your employer complete his/her portion of the application.
5. Mail the application form, signed and dated, with the appropriate payment, to NNCC.

How will I know my application was received?

Within a four (4) week processing time, you will receive 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 if I need to test right away?

Expedited Review is a service for applicants who need to test right away. Instead of your application being processed in the order in which it was received, C-NET pulls your application to the front of the line for immediate processing. *Expedited Review* exam permits will be issued within 1 to 3 business days from the time the application is received by C-NET. Examination permits are issued only to applicants with completed, approved applications. (Note: there is an additional fee for *Expedited Review*.)

What study resources are available?

- The test blueprint and practice questions included in this booklet
- The following list of reference used by the CD-LPN/LVN item writers:
 - Core Curriculum for Nephrology Nursing, 6th edition.
 - Kallenbach's Review of Hemodialysis for Nurses and Dialysis Personnel, 9th edition.
 - The regulations in the CMS Conditions for Coverage for End-Stage Renal Disease Facilities.
- The online practice test (found on www.nncc-exam.org)

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. NNCC tests candidates on content and not on their "test taking skills." If you have any questions about the best methods to prepare, please call us at 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 are contained 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 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 will take a short tutorial explaining the test setup and keyboard key functions just before your test begins.
- You will have three (3) 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 Dialysis Practice Areas on the CD-LPN/LVN 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?

There is no limit to the number of times you can take the exam. If you are unsuccessful on the exam, you may reapply by mailing in a new application. You can avoid the 3-4 week processing time by checking the *Expedited Review* box to have your application pulled to the front of the line for immediate processing.

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 alert and open to learning.
- Even though some test takers may finish the exam early, 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.
- Allow plenty of time and arrive early.
- If you are distracted by other candidates, ask for a seat where you will be less likely to notice the other candidates.
- 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, gender, 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

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 members 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 CD-LPN/LVN Examination

The CD-LPN/LVN examination is designed to test the knowledge needed to provide safe care to patients who are receiving hemodialysis treatments. There are two dimensions in the test blueprint, Dialysis Practice Areas and Cognitive Levels. Dialysis Practice Areas include six sections: I. Clinical Interventions, II. Role Responsibilities, III. Technical and Physiologic Principles of Dialysis, IV. Pathology and Complications of CKD and its Treatment, V. Medication Administration, and VI. Infection Control. Specific LPN/LVN activities are tested in each dialysis area. There are also three Cognitive Levels: Knowledge, Comprehension, and Application. These are described in this booklet in the section, "Types of Questions on the CD-LPN/LVN Examination."

Each question on the test fits into one Dialysis Practice Area and one Cognitive Level. This is shown on the blueprint grid. The entire test is mapped out in this manner to guide the item writers when they are developing the test.

I. Clinical Interventions (25%)

Questions in the Clinical area deal with patient care before, during, and after a dialysis treatment. Examples of the kinds of LPN/LVN activities tested in the Clinical area include:

1. Use aseptic technique for dialysis procedures.
2. Monitor patient during dialysis treatment.
3. Maintain appropriate caregiver/patient relationships.
4. Use appropriate communication techniques/skills with patients (verbal/nonverbal).
5. Monitor dialysis equipment during treatment.

II. Role Responsibilities (18%)

Questions in this area deal with roles of various staff members in the dialysis facility, as well as communication skills. These skills include interactions between LPN/LVNs and patients that maintain professional boundaries, as well as respect the patients' privacy, dignity, and confidentiality. Examples of the kinds of LPN/LVN activities tested in the Role Responsibilities area include:

1. Maintain patient's confidentiality.
2. Encourage and support dialysis treatment prescription and adherence.
3. Document findings and interventions/activities performed.
4. Reinforce patient education according to patient teaching plan.
5. Serve as member of unit-based committee (policy & procedure, safety).

III. Technical & Physiologic Principles of Dialysis (17%)

Questions in this area deal with principles of water treatment, components of the extracorporeal circuit, and actions to take when alarms sound or machine-related problems occur. Examples of the kinds of LPN/LVN activities tested in the Technical area include:

1. Ensure safe and proper use of equipment.
2. Apply scientific principles of dialysis underlying patient care (ultrafiltration).
3. Take corrective action when equipment malfunctions ("troubleshoot").
4. Perform cannulation of a new access.
5. Recognize principles related to water treatment (ion exchange, absorption).

IV. Pathology & Complications of CKD & its Treatment (15%)

Questions in this area deal with the LPN's ability to recognize changes in a patient's status to prevent complications and provide appropriate interventions based on protocols or medical orders. Examples of the kinds of LPN/LVN activities tested in the Pathology and Complications of CKD area include:

1. Recognize and report potential or actual adverse patient occurrences.
2. Identify complications of end-stage renal disease (CKD Stage 5).
3. Recognize and report an emergency clinical situation.
4. Identify/report/document an adverse event (equipment set-up problems).
5. Recognize and report signs/symptoms of access failure (stenosis, clotting).

V. Medication Administration (15%)

Questions in this area deal with providing competent and safe care based on the five rights of medication administration (the right patient, the right drug, the right dose, the right route, and the right time). Examples of the kinds of LPN/LVN activities tested in the Medication Administration area include:

1. Follow protocol for administering heparin.
2. Use syringes and needles to draw up and administer medications or solutions.
3. Administer catheter block/flush/lock post-dialysis.
4. Administer oxygen per order/protocol.
5. Perform medication review with patient.

VI. Infection control (15%)

Questions in this area deal with following appropriate precautions, e.g., standard or isolation, as well as recognizing and reporting signs and symptoms of infection to the appropriate healthcare provider. Examples of the kinds of LPN/LVN activities tested in the Infection Control area include:

1. Use dialysis/standard precautions.
2. Follow infection control precautions (isolation, vaccinations).
3. Recognize and report signs and symptoms of infection.
4. Prepare patient's hemodialysis catheter tips/caps pre-dialysis.
5. Obtain blood cultures per unit protocol.

The complete list of activities can be found on the NNCC website in the CD-LPN/LVN section. Click on The Exam, then on Exam Specifications.

Distribution of 150 Question in the CD-LPN/LVN Exam
(adopted in 2011)

Cognitive Level Dialysis Practice Area	A. Knowledge	B. Comprehension	C. Analysis & Application	Total
	I. Clinical Interventions	1-3	6-8	27-29
II. Role Responsibilities	1-2	5-7	20-22	26-28 (18%)
III. Technical & Physiologic Principles of Dialysis	1-2	5-7	18-20	25-27 (17%)
IV. Pathology & Complications of CKD & its Treatment	1-2	4-6	16-17	21-23 (15%)
V. Medication Administration	1-2	4-6	16-17	21-23 (15%)
VI. Infection Control	0-1	2-4	10-12	14-16 (10%)
Total	6-8 (5%)	29-31 (20%)	112-114 (75%)	150

Type of Questions on the CD-LPN/LVN Examination

Several different types of questions appear on the CD-LPN/LVN examination. Some questions require a basic recall of knowledge, while others test the LPN/LVN's ability to comprehend a concept. Most of the questions ask the LPN/LVN to apply knowledge in a clinical situation. The CD-LPN/LVN 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 (5%)

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

1. A patient had an arteriovenous fistula (AVF) placed two days ago. The LPN is evaluating the access arm and knows that steal syndrome is
 1. ischemia of the extremity distal to the arterial anastomosis. ✓
 2. ischemia of the extremity proximal to the arterial anastomosis.
 3. hyperemia of the extremity distal to the venous anastomosis.
 4. hyperemia of the extremity proximal to the venous anastomosis.

B. Comprehension (20%)

Test questions at the comprehension level go beyond basic recall to determine the LPN/LVN's deeper understanding of a concept. Words used to describe comprehension include interpret, compare, contrast, explain, estimate, and translate.

2. The LPN is the unit vascular access manager and has referred the following patients to the vascular surgeon. The patient **most** at risk for development of steal syndrome is the
 1. 20-year-old male with a history of substance abuse.
 2. 40-year-old female with hypertension.
 3. 60-year-old male with a history of alcoholism.
 4. 80-year-old female with diabetes mellitus. ✓

C. Application of Knowledge (75%)

Test questions at the application level ask the LPN/LVN 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 with an AVF and steal syndrome is cannulated with 2 needles for the first time. The patient reports numbness and tingling in the fingers of his access arm. Which of the following actions should the LPN take?
 1. Elevate the patient's hand above heart level.
 2. Increase the dialysate temperature.
 3. Apply a glove to the patient's hand. ✓
 4. Discontinue the hemodialysis treatment.

CD-LPN/LVN Certification Preparation Test

This Preparation Test has been developed to give you experience with the type of questions that are on the CD-LPN/LVN examination. On page 14, the correct answers and rationales for each of the questions are given. Compare your answers with the correct answers. Note: These questions will not appear on the actual certification test.

1. A patient on hemodialysis complains of constipation. Which of these recommendations should the LPN expect to be made?
 1. Daily stool softener.
 2. Increased citrus fruit intake.
 3. Modified fluid consumption.
 4. Decreased dietary fiber.
2. A patient's international normalized ratio (INR) is lower than the preferred level. Because the patient is on warfarin sodium (Coumadin), the LPN should evaluate for
 1. malnutrition.
 2. inflammation.
 3. dysgeusia.
 4. vitamin K intake.
3. Which of the following would be a consequence of administering too little heparin?
 1. Prolonged bleeding.
 2. Prolonged treatment time.
 3. Inadequate urea clearance.
 4. Inadequate dialysate flow.
4. Sevelamer carbonate (Renvela) 800 mg PO tid is prescribed for a patient. The LPN should be aware that the side effects of Renvela include
 1. gastrointestinal symptoms.
 2. elevated serum calcium levels.
 3. misanthropic neuropathy.
 4. increased coronary calcification.
5. The nephrologist prescribes calcium carbonate (Tums®) for a patient with CKD who has hypocalcemia. The LPN should instruct the patient to take the Tums
 1. with meals.
 2. between meals.
 3. with oral iron supplement.
 4. with a multivitamin.
6. A patient who frequently shortens treatment time without notice has gained a large amount of fluid between treatments and is short of breath. The LPN should take which of these actions?
 1. Set the ultrafiltration rate above the estimated dry weight and remove fluid in a short amount of time.
 2. Ultrafiltrate only for the first hour, then resume routine treatment time.
 3. Set the ultrafiltration rate to prescription and notify the physician.
 4. Ultrafiltrate only for the patient's entire prescribed treatment time.

7. During routine foot checks for patients who have diabetes mellitus, the LPN finds an ulcer on a patient's heel. After reviewing the patient's laboratory results, which of these findings should the LPN identify as contributing to delayed wound healing?
 1. Calcium 8.5 mg/dL
 2. Potassium 4.0 mEq/L
 3. Hemoglobin 11.2 g/dL
 4. Albumin 2.6 g/dL

8. To allow sufficient time between the HBV vaccine administration and testing for the hepatitis B surface antigen, the LPN should know that the
 1. monthly HbsAg should be drawn the treatment before giving the vaccine.
 2. next monthly HbsAg should be skipped.
 3. monthly HbsAg should be drawn the next treatment after giving the vaccine.
 4. monthly HbsAg should be skipped until the series is completed.

9. A patient who is hepatitis B positive arrives at the facility. Because the facility does not have a separate isolation room, the LPN should realize that the patient will
 1. not be treated at the center.
 2. be transferred to the hospital for admission.
 3. be placed at the end of the row following an empty station.
 4. be placed only with patients who are negative for HbsAg..

10. When reviewing laboratory results, the LPN recognizes that which of the following findings puts the patient at risk for seizures?
 1. Potassium 4.4 mEq/L
 2. Calcium 6.1 mg/dL
 3. Sodium 138 mEq/L
 4. Magnesium 2.2 mg/dL

11. A patient arrives for treatment complaining of shortness of breath. Which of these findings, if present in the patient's laboratory results, would help explain the patient's symptoms?
 1. Transferrin saturation 23%
 2. Ferritin 164 g/dL
 3. Hemoglobin 7.8 g/dL
 4. Hematocrit 38%

12. During a hemodialysis treatment, a patient becomes hypotensive and complains of nausea. The LPN should place the patient in which of these positions?
 1. Trendelenburg.
 2. lithotomy.
 3. reverse Trendelenburg.
 4. modified lithotomy.

13. Several patients experience chills and fever two hours into their treatments. A pyrogenic reaction is suspected. The LPN should expect which of these actions to be taken?
 1. Renal panels will be drawn.
 2. Dialysate cultures will be drawn.
 3. Systems will be checked for blood leaks.
 4. Systems will be checked for chloramines.

14. The Joint Commission has issued a standard on bullying and disruptive behaviors at work, citing concerns about which of the following?
1. Poor patient satisfaction, only.
 2. Poor patient satisfaction, and adverse patient outcomes, only.
 3. Poor patient satisfaction, adverse patient outcomes, and staff turnover, only.
 4. Poor patient satisfaction, adverse patient outcomes, staff turnover, and management emasculatation.
15. An LPN is monitoring a patient whose central venous catheter (CVC) has poor blood flow. The LPN is concerned about clotting in the extracorporeal circuit. Which of these actions by the LPN should be taken **first**?
1. Increase the ultrafiltration rate.
 2. Decrease the blood pump speed.
 3. Administer a heparin bolus.
 4. Flush the system with saline.
16. High venous pressures during hemodialysis can be caused by
1. a clot in the return bloodline.
 2. a kinked heparin line.
 3. an empty saline bag.
 4. air bubbles in the system.
17. An LPN responds to a blood leak alarm. In addition to blood loss, which of the following may occur if the blood leak is not corrected immediately?
1. The blood could clot in the extracorporeal circuit.
 2. The dialysate could clot in the dialysate delivery system.
 3. The dialysate will prevent the blood from clotting.
 4. The blood could become contaminated by the dialysate.
18. An LPN is putting away boxes of supplies received in the weekly delivery. The proper way to lift a box is to
1. stand with the feet a shoulder-width apart and bend from the hips and knees.
 2. stand with the feet together, bend at the waist, and lift with the abdominal muscles.
 3. stand with the feet a shoulder-width apart and lift using the back muscles.
 4. stand with the feet together, bend at the waist, and lift with the hips and knees.
19. A male patient on maintenance hemodialysis says that he has some questions based upon a newspaper article he read. "It said that 30% of dialysis patients in the United States are candidates for home treatment. Can I do home dialysis?" Based upon the LPN's understanding of home therapies, which statement is accurate?
1. The patient's options are based on the type of health insurance he has.
 2. The patient should discuss options in his care planning meetings.
 3. Home dialysis is recommended because fewer treatments per week are required.
 4. Home dialysis is not recommended because it is not as safe as in-center dialysis.
20. While precepting, the LPN explains that the purpose of dialysate is to create a concentration gradient to promote
1. diffusion of waste products from the patient's blood.
 2. removal of any proteins used during dialyzer manufacturing.
 3. exposure of the patient's blood to foreign substances.
 4. biocompatibility related to the patient's needs.

21. A patient's postdialysis BUN level is 54 mg/dL and her predialysis BUN is 12 mg/dL. Based on these results, the LPN should take which of these actions?
1. Recommend an increase in treatment time.
 2. Have the access evaluated.
 3. Counsel the patient about eating during dialysis.
 4. Repeat the laboratory studies.
22. When reviewing a patient's iron studies with a new employee, the LPN explains that the **best** indicator of the iron readily available for erythropoiesis is
1. iron.
 2. ferritin.
 3. transferrin saturation.
 4. total iron-binding capacity.
23. A patient returns from interventional radiology after placement of a tunneled central venous catheter. The LPN should monitor the patient for which **early** complication?
1. Infection.
 2. Pneumothorax.
 3. Hemoperitoneum.
 4. Stenosis.
24. Patients infected with which of the following microorganisms must be **excluded** from a dialyzer reprocessing/reuse program?
1. Human immunodeficiency virus (HIV).
 2. Hepatitis B virus (HBV).
 3. Methicillin-resistant *Staphylococcus aureus* (MRSA).
 4. Vancomycin-resistant enterococci (VRE).
25. A patient tells the LPN that she is afraid of needles and pain and won't allow the staff to cannulate her arteriovenous fistula (AVF). The LPN discusses the patient's fear with the nurse practitioner and the patient receives a prescription for EMLA cream. The LPN instructs the patient to apply the cream to her AVF
1. with a clean glove as soon as she sits in the dialysis chair.
 2. with a sterile glove as soon as the staff cleans the sites.
 3. at home and cover with sterile gauze.
 4. at home and cover with plastic wrap.
26. The LPN notices that an experienced technician is telling a new technician what to do in a loud, authoritative voice for everyone to hear. The LPN should recognize this behavior as an example of
1. a HIPAA violation.
 2. a QAPI exception.
 3. intimidation.
 4. leadership.
27. The LPN reinforces patient education about the potassium content of various foods. Which of these statements, if made by the patient, would indicate learning had occurred?
1. "Fresh fruits contain more potassium than dried fruits."
 2. "Baking rather than boiling potatoes reduces their potassium content."
 3. "Most salt substitutes are high in potassium."
 4. "Tomato products are generally low in potassium."

28. The LPN should recognize that patients with which of the following laboratory values may require a hepatitis B vaccine booster?

1. Anti-HBs less than 10 mIU/ml.
2. Anti-HBs greater than 10 mIU/ml.
3. HbsAg less than 10 mIU/ml.
4. HbsAg greater than 10 mIU/ml.

29. The LPN knows to monitor patients for which major complication related to the administration of epoetin alpha (Epogen)?

1. Elevation in parathyroid hormone.
2. Elevation in blood pressure.
3. Decrease in phosphorus.
4. Decrease in pulse rate.

30. A unit-based committee is formed to develop a Sharps Injury Prevention Program. Safety techniques are identified with input from employees. An effective technique to prevent accidental needlestick injuries would be to

1. report any exposure to blood to the charge nurse.
2. participate in the evaluation of using blunt needles for all patients.
3. document unsafe work conditions that could lead to blood exposure.
4. communicate with team members when discarding used sharps.

CD-LPN/LVN 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 are:

- Counts, C.S. (Ed.) (2015). *Core Curriculum for Nephrology Nursing*. 6th ed. Pitman, NJ: ANNA.
- Daugirdas, J.T., Blake, P.G., & Ing, T.S. (2015). *Handbook of Dialysis*. 5th ed. Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins.
- Gomez, N.J. (Ed.). (2011). *Nephrology Nursing Scope and Standards of Practice*. 7th ed. Pitman, NJ: ANNA.
- Kallenbach, J. Z. (2016). *Review of Hemodialysis for Nurses and Dialysis Personnel*. 9th ed. St. Louis, MO: Elsevier Mosby.
- Medical Education Institute, Inc. (2012). *Core Curriculum for the Dialysis Technician: A Comprehensive Review of Hemodialysis* (5th ed.). Madison, WI: MEI.
- Wilson, B.A., Shannon, M.T., & Shields, K.M. (2015). *Pearson Nurse's Drug Guide 2016*. Hoboken, NJ: Pearson Education, Inc.
- Centers for Medicare & Medicaid Services. Conditions for Coverage. www.cms.gov
- Centers for Disease Control and Prevention. www.cdc.gov

1. **Answer:** 1

Blueprint Area: Comprehension/Pathology & complications of CKD & its treatment

Constipation is a frequent problem for patients on dialysis. Stool softeners are often prescribed as needed.

Core Curriculum, Module 2, p. 263

2. **Answer:** 4

Blueprint Area: Analysis & Application/Clinical interventions for dialysis patients

Vitamin K is essential for prothrombin formation for blood coagulation. Patients who take warfarin sodium (Coumadin) need to maintain a steady intake of vitamin K to prevent blood coagulation problems. Foods high in vitamin K are restricted.

Core Curriculum, Module 2, p. 282

3. **Answer:** 3

Blueprint Area: Analysis & Application/Technical & physiologic principles of dialysis

With adequate heparinization, there is better clearance of solutes through the dialyzer membrane. Adequate heparinization also clears the dialyzer more thoroughly, allowing the patient to receive as many red blood cells as possible when the blood is returned at the end of the treatment.

Review of Hemodialysis, p. 135

4. **Answer:** 1

Blueprint Area: Knowledge/Medication administration

Sevelamer carbonate (Renvela) may have gastrointestinal side effects, including diarrhea, dyspepsia, vomiting, nausea, constipation, and flatulence.

Core Curriculum, Module 2, p. 136, 319; *Pearson Nurse's Drug Guide*, p. 1,415

5. **Answer:** 2

Blueprint Area: Analysis & Application/Clinical interventions for dialysis patients

When used as a calcium supplement, calcium carbonate (Tums®) should be taken 60 to 90 minutes after meals. When taken with meals, Tums® binds with phosphorus.

Pearson Nurse's Drug Guide, p. 238

6. **Answer:** 3

Blueprint Area: Analysis & Application/Technical & physiologic principles of dialysis

The ultrafiltration component of the patient's hemodialysis prescription should be optimized with a goal to achieve a euvolemic or normotensive state. When it is not possible to do so safely, the physician should be notified since an additional treatment may be necessary..

Core Curriculum, Module 3, p. 115; CMS CfC Interpretive Guidance, V543

7. **Answer:** 4

Blueprint Area: Analysis & Application/Pathology & complications of CKD & its treatment

Low albumin levels are linked to increased morbidity (i.e., impaired wound healing and higher hospitalization rates) and increased mortality when albumin levels are lower than 3.5 g/dL.

Core Curriculum, Module 2, p. 258; *Review of Hemodialysis*, p. 191, 197; *Handbook of Dialysis*, p. 535

8. **Answer:** 1
Blueprint Area: Analysis & Application/Medication administration
Transient HbsAg positivity can occur in patients following HBV vaccination. Dialysis patients who have recently been vaccinated can present a false positive HbsAg. Therefore, the sample for testing HbsAg should be drawn prior to the vaccine administration.
Core Curriculum, Module 2, p. 349
9. **Answer:** 3
Blueprint Area: Analysis & Application/Infection control
If a separate room is not possible, the dialysis facility must be able to establish an isolation area in compliance with the Conditions for Coverage for ESRD facilities. The area used to treat HBV positive patients must be separated from other stations by a space at least equivalent to the width of one hemodialysis station. The isolation station could be an "end of row" station to facilitate the separation of the area from the mainstream of the dialysis facility's activities and to decrease the number of adjacent dialysis stations.
Core Curriculum, Module 2, p. 353; CMS CfC Interpretive Guidance, V128
10. **Answer:** 2
Blueprint Area: Analysis & Application/Pathology & complications of CKD & its treatment
When a patient's serum calcium levels drop below 8.7 mg/dL, neurologic symptoms may occur, including seizures, anxiety, confusion, and irritability.
Core Curriculum, Module 3, pp. 154; Module 4, p. 88
11. **Answer:** 3
Blueprint Area: Analysis & Application/Pathology & complications of CKD & its treatment
Adults with CKD Stage 5 on dialysis should be treated with erythropoietin stimulating agents (ESAs) to prevent the hemoglobin from dropping below 9.0 g/dL. This will prevent the patient from developing signs and symptoms related to anemia, which include fatigue, pallor, hypotension, tachycardia, and shortness of breath. The target hemoglobin level is 10-12 g/dL.
Core Curriculum, Module 2, p. 133, 165; Scope and Standards of Practice, p. 80
12. **Answer:** 1
Blueprint Area: Comprehension/Clinical interventions for dialysis patients
Management of the acute hypotensive episode includes placing the patient in Trendelenburg position, administering a normal saline (0.9%) bolus, and decreasing the ultrafiltration rate.
Review of Hemodialysis, pp. 169-170
13. **Answer:** 2
Blueprint Area: Comprehension/Technical & physiologic principles of dialysis
A pyrogenic reaction is caused by pyrogens or endotoxins introduced via dialysate, water, or a reprocessed dialyzer. Signs and symptoms include chills, shaking, fever, hypotension, nausea and vomiting, and muscle pain. With a pyrogenic reaction, more than one patient may be affected at the same time. Both water and dialysate must be checked for bacterial growth and the presence of endotoxins, using high-sensitivity methods.
Core Curriculum, Module 3, p. 145, 165; Scope and Standards of Practice, p. 136; CMS CfC Interpretive Guidance, V178 and V255
14. **Answer:** 3
Blueprint Area: Knowledge/Role responsibilities
The consequences of intimidating and disruptive behaviors can potentially contribute to medical errors, negatively impact safe and effective care, result in poor patient outcomes, impact patient satisfaction, and increase staff turnover.
Core Curriculum, Module 1, pp. 29-30
15. **Answer:** 4
Blueprint Area: Analysis & Application/Clinical interventions for dialysis patients
If the low arterial pressure alarm signals that the blood flow cannot be maintained at the prescribed rate during treatment, the LPN should flush the system with saline to help further assess the condition of the catheter and the extracorporeal circuit.
Core Curriculum, Module 3, p. 212

16. **Answer:** 1
Blueprint Area: Comprehension/Technical & physiologic principles of dialysis
Abnormally high venous pressure readings during hemodialysis could indicate clotting in the access or in the venous bloodline, a poorly working central venous catheter, venous needle infiltration, or kinking of blood tubing.
Core Curriculum, Module 4, p. 95; Review of Hemodialysis, p. 175
17. **Answer:** 4
Blueprint Area: Analysis & Application/Role responsibilities
Dialyzer membranes are fragile and can tear, letting blood and dialysate mix. If this occurs the patient could have major blood loss and blood could be contaminated by the non-sterile dialysate. A blood leak detector is necessary to check for blood in the used dialysate. The detector can sense very small amounts of blood, less than can be seen with the naked eye.
Core Curriculum for the Dialysis Technician, p. 98-99
18. **Answer:** 1
Blueprint Area: Comprehension/Role responsibilities
Proper body mechanics used to lift heavy boxes include standing with the feet a shoulder-width apart and bending from the hips and knees. A person should never bend at the waist or turn when lifting, pushing, or pulling an object. Objects should be lifted by bending the knees, keeping the back straight, and by using arm and leg muscles, not back muscles. After an object is lifted, it should be held close to the body.
Core Curriculum for the Dialysis Technician, p. 181
19. **Answer:** 2
Blueprint Area: Analysis & Application/Clinical interventions for dialysis patients
A patient must be informed about all treatment modalities and settings, including but not limited to transplantation, home dialysis modalities (home hemodialysis, intermittent peritoneal dialysis, continuous ambulatory peritoneal dialysis, continuous cycling peritoneal dialysis), and in-facility hemodialysis.
Core Curriculum, Module 2, pp. 183-184, Module 3, p. 283; CMS CfC Interpretive Guidance, V458
20. **Answer:** 1
Blueprint Area: Analysis & Application/Role responsibilities
In dialysis, a concentration gradient is created between the dialysate and the patient's blood across a semipermeable membrane to remove wastes from the blood. Solutes move across the membrane from an area of higher concentration to an area of lower concentration.
Core Curriculum, Module 3, p. 74; Review of Hemodialysis, p. 22
21. **Answer:** 4
Blueprint Area: Analysis & Application/Clinical interventions for dialysis patients
The normal BUN level is 7 to 18 mg/dL, but the "normal" level for a dialysis patient (pretreatment) is 60 to 100 mg/dL. The urea reduction ratio (URR) measures the reduction of urea in the dialyzed patient from predialysis to postdialysis. Laboratory or blood sampling errors can adversely affect the result.
Core Curriculum, Module 3, p. 100
22. **Answer:** 3
Blueprint Area: Analysis & Application/Role responsibilities
The transferrin saturation (TSAT) is the most common method of measuring iron bioavailability. A TSAT less than 20% is indicative of low iron availability in CKD. Iron stores are commonly evaluated by serum ferritin levels, but in CKD the inflammatory process can increase serum ferritin levels.
Core Curriculum, Module 2, p.131; Review of Hemodialysis, p. 224
23. **Answer:** 2
Blueprint Area: Analysis & Application/Pathology & complications of CKD & its treatment
Early complications of central venous catheter insertion include vessel perforation, bleeding, pneumothorax, hemothorax, arrhythmias, and air embolism.
Core Curriculum, Module 3, p. 209
24. **Answer:** 2
Blueprint Area: Knowledge/Technical & physiologic principles of dialysis
Patients who test positive for hepatitis B (HBV+) must be excluded from any reprocessing/reuse program. Facilities must provide single-use dialyzers and bloodlines for patients who are HBV+.
Core Curriculum, Module 2, p. 353; Review of Hemodialysis, p. 120; CMS CfC Interpretive Guidance, V301

25. **Answer:** 4

Blueprint Area: Analysis & Application/Medication administration

EMLA cream is a topical anesthetic cream that must be applied to the access at least an hour or two before dialysis. After the cream is applied, the patient covers the site with plastic wrap to ensure that the drug meets the required contact time and does not get wiped off prematurely.

Core Curriculum, Module 3, p. 190

26. **Answer:** 3

Blueprint Area: Analysis & Application/Role responsibilities

It is important to recognize inappropriate behaviors that contribute to an unhealthy work environment. Examples include intimidation, belittling or criticizing a colleague in front of others, humiliation, incivility and bullying.

Core Curriculum, Module 1, pp. 30-31

27. **Answer:** 3

Blueprint Area: Analysis & Application/Role responsibilities

Patients who are adequately dialyzed should have a normal range of serum potassium if they follow nutritional guidelines on potassium intake. Patients should be taught to avoid high potassium foods, such as bananas, tomatoes, as well as salt substitutes which contain potassium.

Core Curriculum, Module 4, p. 84

28. **Answer:** 1

Blueprint Area: Analysis & Application/Infection control

If anti-HBs is ≥ 10 mIU/mL, the patient is considered immune and should be retested annually to determine the need for a booster dose. If the anti-HBs declines to < 10 mIU/mL, a booster dose should be administered followed by the patient resuming annual retesting.

Core Curriculum, Module 2, p. 351; CMS CfC Interpretive Guidance, V127

29. **Answer:** 2

Blueprint Area: Analysis & Application/Medication administration

The major complication of epoetin alpha (Epogen) is an elevation in blood pressure due to increased blood viscosity, secondary to increased red blood cell mass.

Review of Hemodialysis, p. 223

30. **Answer:** 4

Blueprint Area: Analysis & Application/Infection control

The use of work practice controls can reduce the risk of sharps injuries during patient care. Work practice controls include using instruments to grasp needles instead of fingers, giving verbal announcements when passing or discarding needles (instruments), avoiding hand-to-hand passage of sharps, and using needle-free IV line connectors.

Core Curriculum, Module 2, p. 365



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