

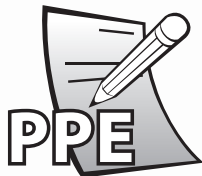


BONENT

Board of Nephrology Examiners Nursing & Technology

Candidate Examination Handbook

- Certified Hemodialysis Technologist/Technician (CHT)
- Certified Hemodialysis BioMedical Technician (CHBT)
- Certified Hemodialysis Nurse (CHN)
- Certified Peritoneal Dialysis Nurse (CPDN)
- Certified Hemodialysis Water Specialist (CHWS)



**Paper and
Pencil Exam**

&



**Computer
Based Testing**

**Choose from
Over 900
Testing Locations
Worldwide**

Revised January, 2021

The Premier International Organization for Certification of Nephrology Professionals

The Board of Nephrology Examiners Nursing Technology (BONENT) is a non-profit organization promoting excellence in the quality of care of nephrology patients in the United States and many countries around the world.

BONENT serves as a trusted representative voice to policy makers by urging legislative and regulatory movement toward meaningful training, certification and credentialing of nephrology practitioners.

Recognized since 1974 as the leading, independent professional certification body, BONENT identifies safe and competent practitioners in nephrology by providing the most highly regarded comprehensive specialty examinations to achieve the following credentials:

- Certified Hemodialysis Technologist/Technician (CHT)
- Certified Hemodialysis BioMedical Technician (CHBT)
- Certified Hemodialysis Nurse (CHN)
- Certified Peritoneal Dialysis Nurse (CPDN)
- Certified Hemodialysis Water Specialist (CHWS)

Nephrology nurses may receive certification in either or both Hemo and Peritoneal dialysis. Technicians may receive certification one or more - Hemo, Biomed, or Water.

BONENT membership is comprised of nurses and technicians who have received a passing score on a BONENT exam and are thereby certified. Members must recertify every four years. Today, over 7,500 nurses and technicians have met our criteria and are BONENT-certified.

Despite its impressive growth in recent years, BONENT remains largely a “grassroots” organization that depends on the help of all of its members in order to sustain itself, thrive and grow.

Many Benefits of a BONENT Certification

- Increases your ability to provide the highest quality care to patients;
- Carries the distinction of the title CHT, CHBT, CHN, CPDN, or CHWS;
- Provides personal satisfaction from your exam performance;
- Enhances your résumé, which may result in preferential consideration for promotion or salary increases;
- Presents opportunities for your continued professional growth through our recertification programs;
- Presents opportunities to participate in the creation and development of new BONENT programs;
- Includes complimentary subscription to the BONENT newsletter
- Includes complimentary copies of various nephrology publications

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NOTE:

The most detailed and up-to-date policies and handbook may be found on the BONENT web site at:
www.BONENT.org

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Section 1

Examinations

Exam Development

Examination committees conduct analyses of tasks, role delineation, skills and knowledge in conjunction with a professional testing agency. Examination validity is maintained through expert statistical and scientific analysis.

Then, questions are solicited from qualified nephrology nurses and technologists/technicians in different areas of the country. The submitted questions are categorized, edited grammatically and psychometrically, reviewed by experts and placed in an item pool. Questions are drawn from an item pool for placement in an examination.

There are four types of BONENT exams from which to choose:

- Certified Hemodialysis Technologist/Technician (CHT)
- Certified Hemodialysis BioMedical Technician (CHBT)
- Certified Hemodialysis Nurse (CHN)
- Certified Peritoneal Dialysis Nurse (CPDN)
- Certified Hemodialysis Water Specialist (CHWS)

All BONENT examinations are designed, constructed and analyzed for reliability and validity. Each examination is comprised of multiple-choice questions and updated regularly. The examinations should be completed and all questions answered, as scores are based on the number of questions answered correctly.

CHT Exam in Spanish

CHT candidates in the United States are able to take the exam in Spanish. The practice exam, all paperwork and communication (Application, Exam Proctor, Score Report, phone calls, etc.) will remain English-only.

Exam Application

To apply for a BONENT exam, you must submit a completed Application Form, fees and all required documentation. (see pages 23-24 for application and instructions).

Exam Methods

Candidates can choose between two exam methods by which to become BONENT certified:



Paper & Pencil Exam (PPE)



Computer Based Testing (CBT)

The following points are the same for both exam methods:

- Use the same application (candidates must indicate PPE or CBT)
- Require the same amount of time
- Have the same questions
- Have a proctor on site
- You choose your own exam site

The differences between the two exam methods are:

- Each exam method has its own separate list of locations
- Candidates receive a printout of their scores as soon as the CBT exam is completed
- There is no application deadline for the CBT

- Confirmation letters will be sent after your application has been processed and approved. The approximate timeframe of when you receive your confirmation letter depends on the exam method you choose:
 - PPE – 2 weeks before the exam
 - CBT – 4 weeks after BONENT receives your application
- Taking the BONENT exam by Computer Based Testing (CBT) requires basic knowledge of how to use a computer. The exam covers the same material as the Paper & Pencil Exam (PPE). While taking the exam, candidates are able to skip questions, go back to a previous question and change answers.

US & International

Examinations are conducted throughout the United States and as far away as Australia, New Zealand, Singapore, India and a growing list of other countries. Deadlines for international candidates differ from those of their American colleagues, such as:

- Exam applications must be received 60 days prior to the examination at which they wish to appear (PPE Only)
- Host applications must be received a minimum of 120 days prior to the examination date
- Payment for all items must be in United States Currency (credit card or money order only)

Exam Schedules

For a detailed list of PPE locations and times, please visit the BONENT website (www.bonent.org) or contact the Executive Office at (202) 462-1252. This list is updated weekly.



The CBT list of locations is available at www.bonent.org. This list is updated often and is completely different from the Paper & Pencil Exam (PPE) schedule. Most CBT locations' business hours are approximately 9am - 5pm daily and some are open on Saturday. The availability of exam times depends on each location. Since the exam is only 3 hours, they are given once or twice daily. When your application is approved, you will be given a unique ID and password. Specific registration instructions will be itemized in the Confirmation Letter. Only during the process of scheduling your exam time will you be able to access the location and time availability.



Host Opportunities

BONENT Certification Examinations may be offered at various locations throughout the United States and worldwide, upon request. Examinations can be administered anywhere, any time there are five qualified candidates to take the exam.

The candidates may be a combination of Hemodialysis Technologists/Technicians, BioMedical Technicians, Hemodialysis Nurses, Peritoneal Dialysis Nurses, and Hemodialysis Water Specialists.

BONENT encourages certification. Therefore, proctors are required to be a BONENT-certified nurse or technologist/technician, a physician, a dietitian, or a renal social worker. These requirements are necessary to prevent any breach of security of the BONENT examination process.

To host an examination, the sponsor must submit a Host Form, along with other required paperwork to the BONENT Executive Office a minimum of 90 days (120 days for international examinations) prior to the examination date chosen by the Host Facility.

Proctors and assistant proctors are required to submit their résumé or curriculum vitae, and a signed BONENT confidentiality statement. An assistant proctor is required for all exams. After verification of proctor credentials and approval by the Host Review Committee, the exam date and site are added to the PPE Schedule.

Please visit www.BONENT.org to download:

- Host Form
- Proctor/Assistant Proctor Agreement

Section 2

Eligibility and Fees

Eligibility

In addition to requirements imposed by state licensing authorities, applicants must meet the following minimum criteria:

- **Nurses (CHN, CPDN)** – a valid RN license, one year of experience in nephrology and current active participation in an ESRD facility.
- **LPN or LVN** – a valid LVN or LPN license, current active participation in an ESRD facility and for the following exams:
 - CHN or CPDN: two years of experience in nephrology;
 - CHT: 6 months of experience in nephrology.
- **Technicians (CHT)** – a copy of your high school diploma or official transcript (with principal's signature and/or school seal), a minimum of 6 months of experience in nephrology patient care and current active participation in an ESRD facility. If you have no experience as a patient care technician/technologist, you may apply to take the BONENT exam within 2 years of successful completion of a BONENT Approved Training Program.
- **Technicians (CHBT)** – a copy of your high school diploma or official transcript (with a principal's signature and/or school seal), a minimum of 6 months of dialysis BioMedical (BM) experience and any BM training certificates and current active participation in an ESRD facility.
- **Water Specialists (CHWS)** – a minimum of 3 years of dialysis water experience and a copy of your high school diploma or official transcript (with principal's signature and/or school seal), **OR** a minimum of 2 years of dialysis water experience and a copy of your Associates degree or official college transcript. **OR** a minimum of 1 year of dialysis water experience and a photocopy of your Bachelors/Baccalaureate degree or proof of current certification (BONENT: CHT/CHBT; NNCO: CCNT/CBNT; or NNCC: CCHT) or a healthcare credential (e.g., nursing, physician assistant, pharmacist).
- **All Applicants**
 - **Currently Unemployed:** If you are currently unemployed but have the minimum experience as noted for the exams above, you will be required to have your immediate past supervisor sign your application and write a reference letter. All other stated requirements apply.
- **Technicians (CHT & CHBT)**
 - **No High School Diploma:** If you have more than 4 years of work experience in dialysis but cannot provide proof of graduating high school, BONENT will accept your work experience and waive the requirement for a high school diploma.



All experience must be verified by two signed and dated reference letters:

- One from the applicant's immediate supervisor (the same person who signs the verification section of the application)
- The second letter must come from a professional in nephrology (physician, technician, nurse or dietitian)
- Both letters must include the applicant's legal name and verify total length of experience in nephrology (past and present), character and job duties.

Fees

Candidates will not receive a confirmation letter until receipt of all application requirements and fees. **NO exceptions will be made.**

Examination Fees

Country	 Paper & Pencil Exam	 Computer Based Testing
USA	\$225	\$250
International** <small>(locations outside the US)</small>	\$250	\$250

**US dollars only (credit card or money order)

Additional Fees

Incomplete Application Penalty	\$65
Exam Withdrawals & Transfers	\$110
Returned Check Fee	\$80

Incomplete Fee

Applications submitted without signed reference letters, scholastic documentation, license or any other information left blank on the application will be assessed a \$65 incomplete application fee.

Returned Check Fee

A \$80 Returned Check Fee will be charged for any returned checks.

Annual Certification Fee

To maintain a BONENT certification, nurses, technologists/technicians, and water specialists are required to pay an Annual Certification Fee of \$60. There are two payment options – annually (@ \$60), or four years in advance (\$210).

If fees are NOT received by the due date noted on your invoice, a \$10/yr. late fee will apply in the first three years after certification and \$20 in the fourth year.

Recertification (your recertification year)

There is NO extra fee for the Recertification process and wallet card in the fourth year, but the Annual Certification Fee is still applicable.

Section 3

Exam Policies

Applications & Deadlines



Paper & Pencil Exam

Your original, signed application (see page xx-xx) and examination fees (paid in full with application) are required to be received 45 days (60 days for international examinations) before the exam date. Applications received after the deadline will NOT be accepted and will be returned, unprocessed.



Computer Based Testing

There is no deadline to submit your original, signed application and examination fees (paid in full with application).

Faxed or photocopied applications will NOT be accepted.

Candidates will not receive a confirmation letter until receipt of all application requirements and fees. **NO exceptions will be made.**

Applications submitted without signed reference letters, scholastic documentation, license or any other information left blank on the application will be assessed a \$65 incomplete application fee.

If your current legal name does not match the name on your high school diploma, you must list your previous name(s) in the space provided on the application and provide court documentation (i.e. marriage certificate) for each change.

Acceptance



Approximately two weeks before the scheduled exam, candidates whose applications have been accepted will receive an official Confirmation letter indicating the examination site, exact address and time to report for the examination. This letter is your admission ticket for the examination. **You must bring the letter with you in order to sit for the exam.**

All applications and examination fees (paid in full) must be received by the 45-day deadline (60-day international examinations). All applications received after the 45-day (60 days for international examinations) deadline will be returned to the applicant, unprocessed.

Applications received after the deadline will NOT be accepted.



Once we receive your CBT application, it will take approximately 4 weeks for the approval process. After your application is approved, you will receive a Confirmation Letter from BONENT containing registration information including your:

- Unique user ID
- Password

After you receive the above information, you will need to register online for a specific CBT date, location and time. Specific Registration instructions will be itemized in the Confirmation Letter. **You will have a deadline of 6 months to choose when and where you will take the exam.** If you do not take the exam within 6 months of receiving your ID and password your exam fee will be forfeited and, you will have to re-register for the exam at full price.

CBT No-Show Reactivation: Candidates are responsible for scheduling their own CBT time, date and location.

Failure to show up at the scheduled time, date and location with an admissions letter and required identification will result in forfeiture of the CBT exam fee.

However, you may reactivate your user ID and password:

- The fee to reactivate your CBT user ID and password is \$125.
- The CBT No-Show Reactivation Form must be submitted with payment to the BONENT Executive Office, mailed or faxed, no more than 14 days after the missed exam.

ADA Requests

BONENT accepts requests for special examination accommodations under the Americans with Disabilities Act. Candidates with disabilities covered by the Act are required to complete the BONENT Documentation of Disability-Related Needs form and submit it with the exam application. Information provided, and any documentation regarding disabilities or the need to accommodate them, will be treated with the utmost confidentiality.

The Documentation of Disability-related Needs form may be accessed on line (bonent.org/ada-requests/), by written request sent to the BONENT Executive Office or by requesting a copy by phone, (202) 462.1252.

Refunds, Exam Transfers & Withdrawals

Withdrawal Process

Mail or fax a completed, signed Withdrawal Request Form **20 days before the examination date.** If you do not have access to a computer, you may submit a written request. The written request must be signed and include your Social Security Number. A refund of the application fee, minus a **\$110 processing fee**, will be issued. Faxed requests are accepted at the BONENT Executive Office (202) 463-1257. **E-mail requests are not accepted.**

Transfer Processes

PPE Applicants who wish to transfer to a future PPE date: Mail or fax a completed, signed *Transfer Request Form* **20 days before the original examination date** with the **\$110 processing fee**. If you do not have access to a computer, you may submit a signed, written request (indicate original examination date and desired transfer date). Faxed requests are accepted at the BONENT Executive Office (202) 463-1257. **E-mail requests are not accepted.**

PPE Applicants who wish to transfer to a CBT: Mail or fax a completed, signed *Transfer Request Form* **20 days before the original examination date** with the \$110 processing fee plus the \$25 difference in examination fees (**\$135 total**). If you do not have access to a computer, you may submit a signed, written request (indicate original PPE examination date). Faxed requests are accepted at the BONENT Executive Office (202) 463-1257. **E-mail requests are not accepted.**

CBT Applicants who wish to transfer to a PPE: Mail or fax a completed, signed *Transfer Request Form* **before the deadline for the requested examination date** with a **\$85 payment** (\$110 processing fee minus the \$25 difference in examination fees). If you do not have access to a computer, you may submit a signed, written request (indicate the specific PPE exam location and date). Faxed requests are accepted at the BONENT Executive Office (202) 463-1257. **E-mail requests are not accepted.**

Incomplete Processes

If your exam application is incomplete, you must complete it within the given timeframe, or do one of the following:

- Request to withdraw from the exam
- Request to transfer to another exam date

If you do not do any of the above within 1 year of the original exam for which you applied, you will forfeit the full exam fee and you will have to pay the full exam fee the next time you apply.

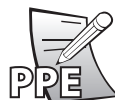
Special Circumstances

In the event that a candidate CANNOT sit for a scheduled examination due to the death of an immediate family member (mother, father, siblings), unexpected natural disaster, or the candidate's hospitalization, the candidate will be able to sit for the next scheduled examination in his/her area. Documentation of the event must accompany the written transfer request. All requests for special circumstances or transfer must be submitted in writing (by mail or fax)

- PPE - no later than 30 days after the scheduled exam with the \$110 processing fee.
- CBT - submit a signed and dated request less than 7 days before scheduled exam with \$110 processing fee.

Exam Results

BONENT will not provide candidate scores over the telephone, via e-mail or via fax



Candidates can expect to receive their exam results approximately 3 to 4 weeks following the date of the

exam. Exam results are sent via USPS First Class mail to the address on your application form.



CBT candidates will receive a printed copy of their results and pass/fail status at the conclusion of the examination session.

Manual Re-scoring

Any candidate failing to achieve a passing score on the Paper & Pencil Exam may request a manual re-scoring of the candidate's answer sheet. The fee is \$100, payable to BONENT. A request for manual re-scoring must be submitted in writing to the Executive Office, accompanied by the \$100 fee within 100 days following the examination date. The request must include: the candidate's name, current mailing address, Social Security number, examination date and location.

Re-examination

In the event a candidate does not achieve a passing score on the examination, the candidate may retake the next available examination. The candidate must submit a signed application, or a retake request form with a copy of the most recent exam score report.

Applicants are given a maximum of three opportunities to successfully complete the examination within 12 months. If passing the examination does not occur after 3 attempts, applicants will be required to complete 8 hours of nephrology-related continuing education or attend and complete a nephrology educational program. A certificate of participation or passing grade must be submitted before taking a future BONENT examination.

After one year has lapsed since the candidate's initial examination, appropriate documentation must be resubmitted with the exam application (reference letters, high school diploma, etc.)

Multiple Certifications

If a nurse, technician, or water specialist wishes to apply for multiple certifications the candidate must pay the application fee for each type of examination for which they wish to sit. Payment of the application fee must accompany the completed application. The \$60 Annual Certification Fee must be paid for each certification.

Duplicate Certificates

To receive a duplicate certificate, your Annual Certification Fees must be paid up-to-date. The fee to purchase a Duplicate Certificate is \$30. There are two ways to purchase a duplicate certificate.

1. Log into the My Account section of the BONENT website and order a duplicate certificate through the online store.

OR

2. Complete the Duplicate Certificate Request Form and submit it to BONENT with payment.

Duplicate Wallet Cards

To receive a duplicate wallet card, your Annual Certification Fees must be paid up-to-date. The fee to purchase a Duplicate Wallet Card is \$20. There are two ways to purchase a duplicate wallet card.

1. Log into the My Account section of the BONENT website and order a duplicate wallet card through the online store.

OR

2. Complete the Duplicate Wallet Card Request Form and submit it to BONENT with payment.

Section 4

Recertification and Renewal

BONENT adheres to the premise that certification not only promotes excellence in the quality of care of the nephrology patient, it ensures safe, competent practitioners in nephrology nursing and technology. Initial certification is the result of having successfully passed the BONENT certification examination.

How Often Must You Renew?

Recertification is required every four years. Certification is valid from the date the candidate originally passed the examination. Documentation is due within 30-days of the certification expiration date to avoid revocation of the credential. **Faxed Recertification Applications or booklets will NOT be accepted.**

We cannot process your recertification application or booklet until all fees for previous years and the current year are paid in full. It takes 4 weeks to process recertification applications and booklets. After approval, you will receive a new BONENT wallet card in the mail.

A 30-day grace period will be allowed after the certification renewal date expires before the candidate will be required to complete the reinstatement process.

Lapsed Certification

(1 to 12 months after your certification expiration date.)

Technicians, nurses, and water specialists who want to reinstate a lapsed certification can:

- Pay the \$100 Lapsed Certification Fee
- Pay any outstanding Annual Certification Fees and
- Submit: 40 contact hours, or use the one-time Waiver, which allows you to automatically recertify without submitting contact hours.

To use the one-time waiver, you must check the box next to the "I wish to use my one-time waiver" option on the Recertification Application. Once the waiver is used, it cannot be used again. After using the waiver, you must have the required amount of contact hours or take the BONENT exam each time you are due to recertify.

Expired Certification

(13 months to 8 years after your certification expiration date)

Technicians, nurses, and water specialists who want to reinstate an expired certification can:

- Submit 40 contact hours from the past four years and
- Pay the \$200 Expired Certification Fee
- You do not qualify to use the one-time waiver.
- Your new certification expiration date will be 4 years from the date your contact hours are approved.

How to Recertify

Initial certification is the result of having successfully passed the BONENT certification examination and is valid for four years from the date the candidate originally passed the examination. In order to continue certification beyond the initial four-year period, you must recertify using one of the following three options:

1. Accumulation of 40 Contact Hours

- A minimum of thirty (30) out of the 40 contact hours must qualify for Group A.
- BONENT members eligible for recertification will only be required to complete the one-page Recertification Application and submit it to the BONENT Executive Office. The application will be the only paperwork required to complete recertification. It is recommended that all members continue to complete the "Contact Hours for Recertification" booklet and keep their certificates to help track their courses and number of contact hours.

OR

2. Re-Examination

This option should be accomplished during the fourth year of BONENT certification. A schedule of examination dates and sites is available on our website www.BONENT.org. The examination fee must be paid at the time the individual registers for the examination. Taking the exam does not exempt you from paying the annual fee. If you pass the exam, you will receive a new BONENT wallet card in the mail.

OR

3. One-time Waiver

Use the one-time waiver which allows you to automatically recertify without having to accumulate 40 contact hours. This option does not exempt you from paying the annual fee.

4. NNCO Certificants

As of January 1, 2021, if you hold an NNCO certification (CCNT, CBNT, CDWS), visit the NNCO Recertification page of the BONENT website for recertification instructions.

Payment

To maintain a BONENT certification, nurses, technologists/ technicians, and water specialists are required to pay an Annual Certification Fee of \$60. There are two payment options – annually (@ \$60) or four years in advance (\$210). There is NO extra fee for the Recertification process and wallet card in the fourth year, but the Annual Certification Fee is still applicable. If fees are NOT received by the due date, a \$10 late fee will apply in the first three years after certification and \$20 in the fourth year (your recertification year).

Returned Check Fee

A Returned Check Fee (\$80) is assessed for any returned checks.

Incomplete Fee

Incomplete Recertification Applications will be assessed a \$65 incomplete application fee.

Section 5

Guidelines and Rules for Examinations

Bring to the Exam

The applicant's Confirmation Letter lists the test center's address. To gain admission to the test center the applicant **MUST** show the Confirmation Letter to the supervising proctor.

The applicant **MUST** provide **one** form of photo identification:

- A valid driver's license
- A valid government-issued ID card with photo
- A valid passport
- A notarized photo with the Candidate's name printed on the back

These are the **ONLY** acceptable forms of ID.

Employment and student I.D. cards are NOT acceptable forms of identification.

You must have proper identification to gain admission to the test center.

PPE Applicants must report to the test center at the time listed on the Confirmation Letter. Seating of candidates, distribution of test materials and testing instructions begin shortly thereafter. The actual starting time of the test may vary at different test centers due to the amount of time necessary for pre-administration procedures.

ANYONE WHO ARRIVES AFTER TESTING BEGINS WILL NOT BE ADMITTED.

Guidelines for Day of Exam

BONENT provides these guidelines as part of its criteria for candidates who are scheduled to sit for an exam:

- Do not bring pencils. Pencils will be provided.
- You may take your watch to the examination to help pace yourself during the examination. The test center supervisor will keep the official time and ensure that you are given the correct amount of time for the examination.
- No books, calculators, writing instruments, slide rules, papers, dictionaries or other reference materials may be taken into the examination room.
- No electronic devices are permitted in the examination room or center, including cell phones or signaling devices such as pagers, alarms, and PDAs (personal digital assistants).
- No examination materials, documents or memoranda of any kind are to be taken from the examination room.
- No questions concerning the content of the examination may be asked during the examination. Listen carefully to the instructions given by the Supervising Proctor and read all directions in the examination booklet thoroughly.
- A BONENT observer may be present at the test center. The observer will not answer questions regarding the examination or become involved with exam administration.

The observer will file a report with BONENT after the examination concerning test center facilities and administration procedures.

- You must have the Supervising Proctor's permission to leave the room during the examination. You will not be allowed additional time to make up for time lost.
- The supervising Proctor may dismiss a candidate from the examination for any of the following reasons:
 1. if the candidate's admission to the examination is unauthorized;
 2. if a candidate creates a disturbance, is abusive or otherwise uncooperative;
 3. if a candidate gives or receives help or is suspected of doing so;
 4. if a candidate attempts to remove examination materials or notes from the testing room; and/or
 5. if a candidate attempts to take the examination for someone else.
- Proctors will not accept application materials of any kind. Candidates are required to submit all application materials to the BONENT Executive Office only.

Online Practice Examination

The Online Practice Examination for Hemodialysis Technologists/Technicians was developed by BONENT and conforms to the specifications of the official CHT examination in terms of its content and average degree of difficulty. The online practice exam is only available online and has a length of 50 questions, whereas the official CHT exam has 150 questions. The online practice exam is intended to reflect the knowledge required of a hemodialysis technologist/technician to be successful on the CHT examination.

Payment

The Online Practice Exam is available for a fee of \$60. If you choose to take the practice exam more than once, the \$60 fee must be paid each time.

Do NOT send payment for the practice exam to the Executive Office. The Executive Office does not have copies of the practice exam.

Go to www.BONENT.org to take the online practice exam.

Study Guides

The following section contains detailed content outlines for each of the five BONENT examinations. These examination tools and the Suggested Reading Materials on page xx can be useful study aids when preparing for an examination.

Section 6

Preparing for Exams

BONENT has assembled a list of various textbooks and publications that are currently available to assist candidates in preparing for the examination. Please see page xx to view a list of suggested reference materials for use in preparing for each of the respective examinations.

Certified Hemodialysis Technologist/Technician (CHT)

Examination Content

The BONENT Certified Hemodialysis Technologist/Technician examination measures technical proficiency in certain skills, tasks and general areas of knowledge. The examination tests the following five major domains of practice and tasks performed in the scope of hemodialysis technology:

- | | |
|----------------------------------|-----|
| • Patient Care | 45% |
| • Machine Technology | 12% |
| • Water Treatment | 15% |
| • Infection Control | 18% |
| • Education/Personal Development | 10% |

The examination has a three-hour time

limit and consists of 150 multiple-choice questions.

Legislative Mandates for Certification

In addition to the Federal requirement for certification, some states may require state certification for technologists/technicians who perform certain patient care procedures. It is incumbent upon all applicants to familiarize themselves with any state licensure requirements for the state in which they intend to be certified. For instance, Ohio certification requires that all applicants have completed six months of patient care prior to the administration of the examination.

Other states may have similar requirements.

Detail of Examination Content

I. PATIENT CARE (45%)

A. Evaluate Patient Pre and Post Treatment

1. Evaluate fluid management
 - a. Replacement therapy
 - b. Sequential ultrafiltration
 - c. Ultrafiltration concepts
2. Collect and evaluate patient data
 - a. Vital signs
 - b. Weight evaluation

- c. Access patency
- d. Edema
- e. Signs and symptoms of infection
- f. Hemostasis
- g. Orthostasis
- h. Need for supplemental oxygen

3. Document assessment

- a. Report complaints or observations to nurse
- b. Document observations in medical record
- c. Discuss ultrafiltration plan with nurse

B. Evaluate, Intervene, and Manage Treatment

1. Pre treatment

- a. Set treatment parameters per physician order (e.g., bath, blood flow rate, dialysate flow rate)
- b. Check reuse dialyzer label
- c. Inspect dialyzer
- d. Evaluate access (e.g., patency, infection, appearance)
- e. Prepare vascular access for cannulation
- f. Prepare CVC and change dressing
- g. Gain access
- h. Collect laboratory samples (e.g., cultures, blood, urine)
- i. Administer heparin for initiation of treatment
- j. Verify patient identification at initiation of dialysis
- k. Initiate treatment (e.g., set parameters, blood flow rate, dialysate flow)

- l. Document observations and patient data

2. During treatment

- a. Collect laboratory samples (e.g., cultures, blood, urine)
- b. Monitor and record treatment data
- c. Identify and respond to complications

- d. Notify nurse of any changes in patient condition
- e. Administer oxygen to patient by cannula or mask
- f. Respond to dialysis machine alarms
- g. Document observations and patient data

3. Post treatment

- a. Collect laboratory samples (e.g., cultures, blood, urine)
- b. Perform procedures to terminate dialysis treatment
- c. Needle site care per protocol (e.g., removal, pressure, dressing)
- d. Catheter care per protocol
- e. Document observations and patient data
- f. Check dialyzer efficiency (e.g., clots, fibers, leaks)

II. Machine Technology (12%)

A. Maintain Dialysis Machine

- 1. Clean and disinfect dialysis equipment
- 2. Record all machine disinfection
- 3. Check readiness of emergency equipment
- 4. Verify the calibration of ancillary medical equipment
- 5. Recognize errors in blood and dialysate flow rates

B. Set-up Machine

- 1. Prepare dialysis equipment for treatment (e.g., prime, rinse, fluid delivery system)
- 2. Prepare auxiliary equipment (e.g., oxygen therapy, glucometer, conductivity meter)
- 3. Rotate dialysis equipment in dialysis unit
- 4. Perform residual chemical checks
- 5. Perform required safety checks on dialysis equipment (e.g., conductivity, pH, temperature)
- 6. Test alarms (e.g., air detector, venous/arterial pressure, blood leak detector)
- 7. Prepare and verify bicarbonate and acid solutions

- 8. Document daily equipment logs

C. Evaluate Machine Operation

- 1. Understand quality control of dialysis equipment per Association for the Advancement of Medical Instrumentation (AAMI) standards
- 2. Perform rinse procedures for dialysis delivery systems
- 3. Perform disinfect procedures for dialysis delivery systems
- 4. Understand equipment maintenance records for compliances with regulatory and standard setting
- 5. Adhere to equipment maintenance procedures and schedules

III. Water Treatment (15%)

A. Understand Components/ Design of Systems

- 1. Recognize actions
- 2. Recognize the process of ultraviolet light exposure

B. Maintain Systems

- 1. Understand the process of disinfecting water treatment system
- 2. Understand the maintenance of all treatment components
- 3. Perform water treatment system checks

C. Monitor and Evaluate Systems

- 1. Understand quality control of reprocessing equipment per AAMI standards
- 2. Monitor total chlorine or chloramines
- 3. Maintain water treatment systems records for compliance with regulatory and standard setting

IV. Infection Control (18%)

A. Maintain a Clean and Safe Patient Environment

- 1. Follow all clean/dirty procedures in order to eliminate cross-contamination
- 2. Recognize complications in dialysis treatments regarding infectious diseases (e.g., AIDS, TB, influenza)
- 3. Ancillary equipment and supplies

4. Demonstrate understanding and perform cannulation using aseptic technique for needle insertion and all other required procedures
5. Glove changing
6. Wash machines, station area, and chairs after each patient run
7. Hand washing

B. Use Dialysis Precautions

1. Personal protective equipment (PPE) (e.g., gown, gloves, mask)
2. Disinfecting dialysis station
3. Disposal of biohazard waste and SHARPS

C. Implement Isolation Procedures

1. Designated equipment
2. Understand CMS requirements for designated staff
3. Understand status of patient's hepatitis survey
4. Disinfection

V. Education and Professional Development (10%)

A. Educate Patient

1. Advise patient of discharge instructions (e.g., diet, fluid intake, medication regimen)
2. Advise patient and family members based on physician's orders (e.g., personal hygiene, self-care, treatment modalities)
3. Explain dialysis concepts to patients
4. Review and reinforce dialysis prescription

5. Describe basic features of end stage renal disease (ESRD)
 - a. Complications
 - b. Hemodialysis treatment
 - c. Psychosocial implications
 - d. Dietary restrictions
 - e. Treatment modality
6. Describe treatment of acute renal failure

B. Engage in Professional Development

1. Continuing education of dialysis (e.g., attend meetings, workshops, conferences)
2. Multidisciplinary care plans
3. Medications in the dialysis clinic (e.g., anticoagulants, antihypertensives, erythropoietic stimulating agents (ESA))
4. Proper body mechanics for patient and self
5. Professional ethics and boundaries
6. Dialysis unit safety procedures (e.g., fire drills, disaster drill, bomb threat)
7. Professional literature
8. Role of the preceptor
9. Government regulations
10. Treatment modalities (e.g., peritoneal, transplant, home hemodialysis)

C. Understand Quality-Related Issues

1. Document incidents (e.g., emergency-related, equipment/devices, patient care)

2. Maintain documentation/data
 - a. Process improvement
 - b. Treatment
3. Maintain storage of medications (e.g., heparin, normal saline, Xylocaine)
4. Maintain storage of equipment and supplies
5. Participate in quality assurance process improvement (QAPI) activities
6. Participate in the development of dialysis unit objectives

D. Demonstrate Communication Skills with Staff Members

1. Promote a teamwork approach by offering information, advice, and assistance
2. Contribute to constructive working relationships
3. Participate in self and/or peer evaluations as directed
4. Ensure the confidentiality of patient and employee information
5. Assist in orientation of new staff members

Certified Hemodialysis BioMedical Technologist (CHBT)

Examination Content

The BONENT Certified Hemodialysis Bio-Medical Technician examination measures technical proficiency in certain skills and general areas of knowledge. The examination tests the following eight (8) major domains of practice and tasks performed in the scope of hemodialysis technology:

- Medical Machine Maintenance 24%
- Quality Assurance Performance Improvement 7%
- Water Treatment System Management 30%
- Concentrate System Management 11%
- Reprocessing of Dialyzer 4%
- Life-Safety and Physical Plant Maintenance 9%
- Documentation Practices 7%
- Professional Responsibilities 8%

The examination has a three-hour time limit and consists of 150 multiple-choice questions. Nephrology Technicians may receive certification in one or all technician exams – patient care (CHT), bio-medical (CHBT), and water specialist (CHWS)

Detail of Examination Content

I. MEDICAL MACHINE MAINTENANCE (24%)

- A. Basic hydraulic and electronic circuitry
- B. Purpose and operation of dialysis-related medical equipment
- C. Purpose and use of test equipment and maintenance
- D. Maintenance for medical equipment (e.g., water treatment equipment, dialysis equipment, testing equipment, and mechanical/electrical systems)
- E. Maintenance of machines to complete all scheduled treatments

II. QUALITY ASSESSMENT AND PERFORMANCE IMPROVEMENT (QAPI) (7%)

- A. QAPI principles related to biomed responsibilities
- B. Alerts and recalls, or risk management investigations related to medical equipment

III. WATER TREATMENT SYSTEM MANAGEMENT (30%)

- A. Procedures for the processing of water samples
- B. AAMI analysis water samples
- C. Regulatory requirements for water quality
- D. Clinical manifestations for out-of-range test results
- E. Cultures and endotoxins for water treatment system
- F. Water system cleaning and disinfection requirements
- G. Theory and test methods of water treatment component operation
- H. Valve tags, component labels, directional tape, system schematic, valve legend
- I. State regulatory requirements for alternate water treatment plan and update as needed
- J. Requirement for secure water room

IV. CONCENTRATE SYSTEMS MANAGEMENT (11%)

- A. Bicarb and acid
- B. Principles for testing of specific gravity, conductivity, or pH
- C. Knowledge of concentrate chemistry
- D. Cultures and endotoxins of dialysate
- E. Maintenance of concentrate equipment
- F. Concentrate equipment cleaning and disinfection requirements
- G. Knowledge of concentrate chemistry

V. REPROCESSING OF DIALYZER (4%)

- A. Principles for reprocessing programs

- B. Reprocessing equipment (e.g., automated, manual)
- C. Water treatment systems for reprocessing equipment
- D. Physical plant requirements for a reprocessing program

VI. LIFE SAFETY EQUIPMENT AND PHYSICAL PLANT MAINTENANCE (9%)

- A. Requirements for life safety equipment
- B. Inspections on life safety equipment
- C. Vendors for repair of life safety equipment
- D. Routine inspections of physical plant as per quality requirements
- E. Vendors for repairs related to physical plant

VII. DOCUMENTATION PRACTICES (7%)

- A. Documentation of repair and maintenance (e.g., water treatment, medical equipment, physical plant)
- B. Documentation practices
- C. Review, audit, and trend logs

VIII. PROFESSIONAL RESPONSIBILITY (8%)

- A. Procedures for the processing of Work-related vocabulary, symbols, abbreviations, etc.
- B. Confidentiality of patient and employee information
- C. Regulatory organizations (e.g., AAMI, CMS, OSHA)
- D. Maintenance of professional certification
- E. Support staff on technical issues related to medical equipment
- F. Types of and safe handling of medical waste
- G. Support staff in-service related to biomedical and clinical equipment
- H. Infection control procedures

Certified Hemodialysis Nurse (CHN)

Examination Content

The BONENT Certified Hemodialysis Nurse examination measures nursing proficiency in certain skills, tasks and general areas of knowledge. The examination tests the following four major domains of practice and tasks performed in the scope of hemodialysis nursing.

- Supervision/Administration 10%
- Dialysis and Related Issues 74.5%
- Professional Development 5.5%
- Environmental Control 10.0%

The examination has a three-hour time limit and consists of 150 multiple-choice questions.

Detail of Examination Content

I. SUPERVISION/MANAGEMENT (10%)

A. Personnel Management

Develop and implement policies and procedures relating to personnel management of patient care staff.

1. Patient needs and staffing patterns
2. Staff abilities and limitations
3. Standards of dialysis care
4. Unit policies and procedures relating to personnel management
5. Medical ethical issues involved with patient care

B. Equipment and Supplies

Develop and implement policies and procedures for evaluation of equipment and supplies for potential unit use.

1. Current status of dialysis technology
2. Critical elements for evaluation of dialysis equipment and supplies
3. AAMI Standards for Hemodialysis Systems

II. DIALYSIS AND RELATED ISSUES (74.5%)

A. Patient Care

Collect, document and analyze patient information before, during and after dialysis in order to maintain and/or improve the quality of patient care through continuous evaluation and ongoing revision of interventions.

1. Steps in the nursing process
2. Normal renal anatomy and physiology
3. Fluid and electrolytes
4. Causes of renal failure
5. Clinical manifestations of renal failure
6. Dialysis principles and procedures
7. Physical assessment
 - a. normal and abnormal patient signs and symptoms
8. Nursing interventions
 - a. teaching
 - b. counseling
 - c. referral
9. Charting
10. Medications
 - a. use of medications
 - b. desired effects of medications
 - c. interactions with dialysis
11. Nutritional considerations
 - a. restrictions (i.e., fluid, protein, potassium, sodium)
 - b. dietary noncompliance
12. Complications occurring during dialysis
13. Psychosocial aspects of renal failure
14. Types of vascular access
 - a. creation
 - b. care and precautions
 - c. complications of each type
15. Heparinization
 - a. the coagulation system
 - b. heparin and its effects on the coagulation system
16. Types of adjunctive therapy
 - a. sequential ultrafiltration
 - b. hemoperfusion
 - c. hemofiltration
 - d. bicarbonate dialysis
 - e. high sodium dialysate
17. Determining the adequacy of dialysis
 - a. kinetic modeling

18. Quality control and quality assurance

19. Other treatment modalities
 - a. peritoneal dialysis
 - b. transplantation

B. Machine Set Up

Set up equipment prior to the start of the dialysis procedure to ensure that all parameters are intact and functional.

1. Dialysis fluid delivery systems
 - a. types
 - b. functions
 - i. abnormal functions
 - ii. corrective actions
 - c. monitors and alarms
 - i. function
 - d. disinfectants
 - i. rinsing and testing
 - e. AAMI Standards for Dialysate Supply Systems
2. Dialyzers
 - a. various types
 - b. priming and testing procedures
3. Dialysis Bath
 - a. chemical composition
 - b. types of dialysis baths
 - c. techniques for altering the composition of the dialysis bath
 - d. verification of dialysate composition
4. Ancillary equipment
 - a. procedures for use of ancillary equipment

C. Initiation of Dialysis

Connect patient to dialysis machine to initiate procedure by obtaining access to circulation, taking blood samples, beginning blood flow, administering the anticoagulant, monitoring machine parameters and patient response.

1. Aseptic technique
2. Access to the patient's blood circulation (i.e., types)
3. Machine parameters
 - a. QB
 - b. QD
 - c. TMP/UFR

- d. conductivity
 - e. temperature
4. Blood drawing
 - a. sampling techniques
 - b. blood analyses
 5. Anticoagulation
 - a. parameters
 - b. dosage adjustment
 - c. methods for performing blood clotting time analysis
 6. Patient responses, potential problems and emergencies (i.e., hemolysis, blood leak, venipuncture)
 - a. resolutions
 7. Acute dialysis
 - a. acute renal failure care
 - b. specific and/or special care and precautions to be taken

D. Monitoring During Dialysis

Monitor patient response during dialysis, recognizing and responding to problems and emergencies, by collecting and analyzing patient and machine data in order to maintain safe and effective dialysis.

1. Patient response
2. Machine parameters and adjustments
 - a. QB/QD
 - b. TMP/UFR
 - c. conductivity
 - d. temperature
3. Complications during dialysis
 - a. resolution

E. Termination of Dialysis Procedure

Terminate dialysis procedure by stopping further blood flow, returning the extracorporeal blood to the patient, disconnecting the patient, stabilizing and dressing the access and cleaning the machines.

1. Methods of returning extracorporeal blood
2. Achieving hemostasis of various internal blood accesses
 - a. dressing procedures for all types of dialysis access
 - b. maintaining patency of catheters
3. Cleaning and disinfection of machine
 - a. types of solutions
 - b. solution concentration

- c. dwell time
4. Disposal of software
 5. Potential problems and emergencies associated with the termination of dialysis
 - a. resolutions

F. Home Dialysis

Teach the patient and dialysis partner how to set up the machine, initiate, monitor and terminate the dialysis procedure and recognize and respond to problems, or emergencies in order to maintain safe and effective dialysis in the patient's home.

1. Principles of adult learning

G. Dialyzer Reuse

Procedures used for cleaning, disinfecting and rinsing dialyzers so that they will approximate their original performance characteristics with use of appropriate recycling equipment.

1. Methods of dialyzer recycling
 - a. cleaning and disinfectant solutions
2. Testing procedures
3. Record keeping

H. Water Treatment

Equipment and methods used for treating water to make it suitable for in dialysis procedures in order to remove contaminants and trace elements by use of deionization, reverse osmosis, filtration and/or softening.

1. Source water
 - a. analysis of source water
 - b. normal versus abnormal water
 - i. effect on patient and machinery
2. Methods of treating water
 - a. AAMI Standards
 - b. disinfection and rinsing procedures

I. Transplantation

Current practice relating to renal transplantation in order to inform and support potential and previous transplant candidates and their families.

1. Advantages/disadvantages of kidney transplantation
2. Indications/contraindications for

transplantation

3. Work-up procedures required for transplantation
4. Drugs commonly used as immunosuppressive agents in transplantation
5. Special care needs of patients returning to hemodialysis after a failed transplant
6. Laboratory and other parameters expected in a new transplant patient

III. PROFESSIONAL DEVELOPMENT (5.5%)

A. Information Sharing

Share information with colleagues to stimulate professional growth by participating in and/or organizing formal in-service programs, disseminating professional literature and attending professional meetings.

1. Professional literature
2. Professional organizations
 - a. Purpose of professional organizations

B. Research

Investigate clinical nephrology issues to resolve a problem in order to contribute to the body of nephrology knowledge and improve patient care by using the scientific method.

1. Scientific method and its application
2. Research design and implementation

C. Staff Training

Orient and instruct staff to unit policies and dialysis procedures to maintain the standards of performance by providing learning situations and observing and evaluating performance.

IV. ENVIRONMENTAL CONTROL (10%)

Maintain a safe environment for patients and staff to prevent injury and the spread of disease by developing, promoting and implementing policies for the use and handling of chemical and biological agents and the prevention of contamination.

1. Chemical Agents
 - a. use of chemical agents
 - b. effects of chemical agents
 - c. potential hazards of chemical agents

2. Biological Agents
 - a. potential hazards
 - b. effects of biological agents
 - c. routes of transmission
3. Infection Control

4. Occupational Injuries
5. Hazards Prevention and Control (i.e., fire, bomb threats, power failure, water loss and/or contamination, etc.)

Certified Peritoneal Dialysis Nurse (CPDN)

Examination Content

The BONENT Certified Peritoneal Dialysis Nurse examination measures nursing proficiency in certain skills, tasks and general areas of knowledge. The examination tests the following four major domains of practice and tasks performed in the scope of peritoneal dialysis nursing.

- | | |
|----------------------------|-----|
| • Nursing Process | 60% |
| • Administration | 10% |
| • Education | 20% |
| • Professional Development | 10% |

The examination has a three-hour time limit and consists of 150 multiple-choice questions.

Nephrology nurses may receive certification in either or both hemo and peritoneal dialysis.

Detail of Examination Content

I. NURSING PROCESS (60%)

Collect, document and analyze patient information before, during, and after dialysis in order to maintain and/or improve the quality of patient care through continuous evaluation and ongoing revision of interventions.

A. Interviewing Techniques

B. Physical Assessment

1. Normal and abnormal patient signs and symptoms

C. Nursing Assessment

1. Patient, family, and significant others' knowledge, skills, and self-care abilities
2. Gross and fine motor coordination
3. Hand strength
4. Vision

D. Human Anatomy and Physiology

1. Anatomy and physiology of the kidney and urinary system
2. Anatomy and physiology of the peritoneum
3. Fluid balance
4. Acid base balance
5. Electrolyte balance
6. Erythropoiesis

E. Pathophysiology of the Kidney and Urinary System

F. Etiologies of End Stage Renal Disease

G. Laboratory Testing

1. Patient preparation
2. Nursing responsibilities
3. Interpretation of results

H. Diagnostic Testing

1. Patient preparation
2. Nursing responsibilities
3. Interpretation of results

I. Pharmacology

1. General
2. Alterations in drug excretion and metabolism in end stage renal disease
3. Drugs used frequently in ESRD patients
4. Alterations in drug metabolism and excretion in peritoneal dialysis
5. Kinetics of intraperitoneally administered medications
6. Antibiotics used in peritonitis
7. Methods of administration

J. Medical and Surgical Asepsis

K. Clinical Manifestations of End Stage Renal Disease

L. Dietary Prescriptions for End Stage Renal Disease Patients

1. Predialysis
2. Peritoneal dialysis
3. Hemodialysis
4. Transplantation

M. General Principles of Dialysis

1. Osmosis
2. Diffusion
3. Ultrafiltration
4. Blood flow
5. Membrane area
6. Dialysis solution

N. Kinetics of Peritoneal Dialysis

1. Dialysate to plasma equilibration
2. Ultrafiltration patterns
3. Absorption of calcium, dextrose
4. Obligatory losses of protein, water soluble vitamins, hormones
5. Factors that influence ultrafiltration
6. Factors that influence solute transport
7. Drug transport
8. Kt/V measurement

O. Peritoneal Membrane Characteristics

1. Measurement of peritoneal membrane characteristics (PET)

P. Types of Peritoneal Dialysis

1. CAPD
2. CCPD
3. IPD or NPD

Q. Peritoneal Dialysis Systems

1. (i.e., Cyclers; CAPD systems –

bag-spike, bag-spike with assist device; disconnect systems; sterile connections device)

R. Dialysis Solutions

1. Composition
2. Dextrose concentrations
3. Volumes
4. Containers

S. Access

1. Types
 - a. acute
 - b. chronic
2. Preoperative nursing management
3. Insertion techniques
4. Postoperative management

T. Peritoneal Dialysis Prescription

1. Type of dialysis (i.e., IPD, CAPD, CCPD)
2. Frequency of dialysis
3. Exchange volume
4. Number exchanges
5. Type(s) solution
6. System of equipment to be used
7. Time (total exchange, fill time, dwell time, drain time, etc.)
8. Additives

U. Acute Peritoneal Dialysis (hospitalized, ill patients)

1. Indications
2. Predialysis patient assessment and education
3. Initiating and terminating dialysis
4. Monitoring
5. Patient education, psychosocial support during treatment

V. Procedures

1. Chronic automated dialysis (IPD, CCPD)
 - a. predialysis patient assessment
 - b. machine setup
 - c. initiation of dialysis
 - d. technical problem solving, troubleshooting
 - e. diagnosis and management of patient problems/complications

- f. discontinuing dialysis
- g. post dialysis assessment
- h. documentation

2. Chronic manual dialysis (CAPD)

- a. procedure for initiation of dialysis
- b. exchange procedure
- c. daily patient assessment, documentation
- d. diagnosis and management of patient problems/complications
- e. technical problems
- f. procedure to discontinue or interrupt dialysis

3. Other procedures

- a. warming dialysis solutions
- b. adding medications for IP administration
- c. catheter fluoroscopy
- d. CT scan for diagnosis of internal leaks
- e. splicing damaged catheter
- f. changing catheter adapter
- g. transfer set change

W. Complications

1. Infectious

Etiology, signs and symptoms, diagnostic evaluation, nursing, medical and surgical intervention, sequelae of:

- a. peritonitis
- b. exit site infection
- c. subcutaneous tunnel infection
- d. intraperitoneal abscess
- e. systemic infection (septicemia)
- f. recurrent infections

2. Noninfectious

Etiology, signs and symptoms, diagnostic evaluation, nursing, medical and surgical intervention, sequelae of:

- a. catheter related problems
 - i. malfunction (i.e., malposition, obstruction, air lock, other)
 - ii. pain
 - iii. cuff erosion
 - iv. cuff extrusion
 - v. damage to catheter
- b. surgical complications
 - i. bladder perforation
 - ii. bowel perforation
 - iii. incisional pain
 - iv. external leak
 - v. subcutaneous leak

vi. hemorrhage

vii. ileus

- c. complications resulting from increased intraabdominal pressure
 - i. hernia
 - ii. hemorrhages
 - iii. dialysate leaks
- d. problems related to peritoneal dialysis (inherent and due to less than optimal management)

e. pain

- i. abdominal pain
 - a) low pH
 - b) solution infusion
 - c) empty abdomen
 - ii. low back pain
 - iii. shoulder pain
- f. pneumoperitoneum
 - g. fibrin production
 - h. blood in dialysate
 - i. pleural leak
 - j. changes in pulmonary function
 - k. changes in cardiovascular function
 - l. inherent glucose load
 - m. changes in glucose metabolism
 - n. fluid overload
 - o. hyperkalemia
 - p. hypokalemia
 - q. hypernatremia
 - r. hyponatremia
 - s. hyperphosphatemia
 - t. hypertension
 - u. hypotension
 - v. hyperglycemia
 - w. protein losses
 - x. other losses
 - y. peritoneal eosinophilia
 - z. significant changes in membrane permeability

X. Contraindications to Peritoneal Dialysis

1. Hypercatabolism
2. Pleural-peritoneal communication
3. Inadequate membrane permeability
4. Relative contraindications

Y. Outpatient Nursing Management of the Chronic Peritoneal Dialysis Patient

1. Ongoing assessment, nursing diagnosis and intervention
2. Anemia

- a. etiology
 - b. management
 - c. erythropoietin
 - d. administration
3. Diabetes mellitus
- a. pathophysiology
 - b. glucose control
 - c. insulin pharmacokinetics
 - d. blood glucose monitoring
 - e. urine testing
 - f. systemic complications
 - g. intraperitoneal and subcutaneous insulin administration
4. Gerontology
- a. physiologic changes associated with aging
 - b. interventions to facilitate vision
 - c. interventions to facilitate hearing

Z. Other Treatment Modalities

1. Principles of transplantation
 - a. candidate selection criteria
 - b. pre-transplant evaluation
 - c. surgical procedure
 - d. immunosuppressive therapy
 - e. complications
 - f. success/failure rates
2. Principles of hemodialysis
 - a. indications
 - b. access
 - c. components of the extracorporeal system
 - d. solute and fluid removal
 - e. treatment parameters
 - f. complications

II. ADMINISTRATION (10%)

A. Management

Establish and implement policies/procedures/standards relating to personnel management of patient care staff in order to deliver optimal patient care.

1. Patient needs and staffing patterns
2. Staff abilities and limitations
3. Standards of dialysis care
4. Unit policies and procedures relating to personnel management
5. Medical-ethical issues involved with patient care

B. Staff Training and Development

Orient and instruct staff to unit policies and dialysis procedures to maintain the

standards of performance by providing learning situations and observing and evaluating performance.

C. Environmental Control

Maintain a safe environment for patients and staff to prevent injury and the spread of disease.

1. Biological agents
 - a. potential hazards
 - b. effects of biological agents
 - c. routes of transmission
2. Infection control
 - a. CDC recommendations
 - b. OSHA Standards
3. Hazards Prevention and Control
 - a. i.e., fire, bomb threats, power failures, etc.
 - b. EPA requirements

D. Equipment and Supplies

Develop and implement policies and procedures for evaluation, use and maintenance of equipment and supplies in order to deliver safe, effective, and economical care.

1. Current status of dialysis technology
2. Critical elements for evaluation of dialysis equipment and supplies

E. Budgeting/Financial Planning

Determine short and long term operational and financial goals and strategies in order to achieve efficient management of the peritoneal dialysis program.

1. Budget/financial/operational planning
2. Reimbursement structure
3. Regulations/options
4. Institution's financial strategies and billing system

F. Quality Assurance

Establish and implement a quality assurance program that ensures compliance with established standards in order to provide optimal patient care.

1. Continuous quality improvement

III. EDUCATION (20%)

Instruction and guidance for the patient and/or family and significant others in peritoneal dialysis theory and procedures based on the principles of adult learning,

to achieve optimal health status.

A. Principles of Learning

1. Learning styles
2. Teaching methods
3. Learning domains
 - a. i.e., cognitive, psychomotor, affective

B. Activities and Teaching

1. Comparison to nursing process
2. Assessment/diagnosis phase
 - a. assessment of learning needs
 - b. assessment of readiness and ability to learn
3. Planning phase
 - a. teaching activities
 - b. purpose
 - c. developing the teaching plan
 - i. behavioral objectives
 - ii. content and outline
 - iii. learning activities
 - iv. alternative teaching strategies
 - v. evaluation
4. Implementation phase
5. Evaluation phase

IV. PROFESSIONAL DEVELOPMENT (10%)

A. Information Sharing

Share information with colleagues to stimulate professional growth by participating in and/or organizing formal in-service programs, disseminating professional literature and attending professional meetings.

1. Professional literature
2. Professional organizations

B. Research

Participate in and/or conduct research designed to analyze and validate current practice and procedures and generate new knowledge. Communicate the information obtained to clarify, revise, and strengthen nursing practice.

1. Scientific method and its application
2. Research design and implementation

C. Ethics

Adhere to the professional code of ethics (e.g., patient confidentiality, patient's rights, informed consent,

allocation of resources) and intervene, if necessary, when violations of practice standards, institutional policies, codes of ethics, or legal standards have been identified in order to protect the peritoneal dialysis patient and the public.

1. Nursing Code of Ethics
2. State Nurse Practice Act
3. Patient's Bill of Rights
4. Nursing Practice Standards
5. Patient Care Standards

6. Legislative process
 - a. legal standards
 - b. legal ramifications

Certified Hemodialysis Water Specialist (CHWS)

Examination Content

The BONENT Certified Hemodialysis Water Specialist examination measures technical proficiency in certain skills and general areas of knowledge. The examination tests the following seven (7) major domains of practice and tasks performed in the scope of hemodialysis technology:

- Water Quality Standards (15%)
- Water Treatment Terminology and Acronyms (5%)
- Basic Water and Water Quality (15%)
- Risks & Hazards Associated with Inadequately Treated Water (15%)
- Water Purification Equipment (20%)
- Water System Performance and Monitoring (15%)
- Disinfection Strategies and Prevention Practices (15%)

The examination has a three-hour time limit and consists of 175 multiple-choice questions.

Nephrology technicians may receive certification in one or more of the following exams: Patient Care Technologist/Technician (CHT), Bio-Medical Technician (CHBT) or Water Specialist (CHWS).

Detail of Examination Content

DOMAIN I: Water Quality Standards (15%)

A. Safe Drinking Water Act (SDWA) (1975)

1. SDWA Amendments: "The Lead Laws" (1996)
2. EPA Drinking Water Standards, i.e. MCLPrimary
 - a. Secondary
 - b. Other

B. FDA Regulations

1. CFR Part 820 Quality System Regulation
2. GMP/CGMP
3. 510k
4. Guidance Documents
5. Pharmaceutical Water Standards-US Pharmacopeia

C. ANSI/AAMI/ISO Standards & Recommended Practice

1. RD Guidance Documents
2. ISO/IEC Documents
3. TIR

D. Centers for Medicare and Medicaid Services (CMS)

1. Conditions for Coverage
 - a. Medical Director Responsibilities
 - b. Governing Body Responsibilities
 - c. Clinical Manager Responsibilities
 - d. Biomedical Technician Responsibilities
2. Interpretive Guidelines
3. Water Treatment System Survey – V Tags

E. Water Quality Associations

1. WQA
2. UWQA
3. NSF
4. AWWA
5. ASTM

F. Other Standards

1. IAMPO Universal Plumbing Code (UPC)
2. NFPA Life Safety Code
3. OSHA
4. American Hospital Building Code
5. State Plumbing Boards

6. Local Plumbing Boards and Sewer Authorities

DOMAIN II: Water Treatment Terminology and Acronyms (5%)

A. Introduction

B. Terminology and Acronyms

C. Units of Measure/Formulas

DOMAIN III: Basic Water and Water Quality (15%)

A. Hydrologic Cycle

B. Meteoric Water

C. How Water Acquires Impurities

1. Environmental Factors

D. Chemistry

1. Physical and Chemical Changes
2. Elements
3. Compounds and Mixtures
4. Atoms and Molecules
5. Nuclear Atom
6. Electrons
7. Bonds
 - a. Ionic
 - b. Valence
8. Redox Reactions
9. Ions
10. pH
11. Acids
12. Bases
13. Salts

DOMAIN IV: Risks & Hazards Associated with Inadequately Treated Water (15%)

A. Contaminants with Documented Toxicity in Hemodialysis

1. Organic
2. Inorganic
3. Microbiological

- Radioactive Contaminants

B. Source Water Characteristics

- Types of Source Water
- Municipal Source Water Suppliers
- Communication with Municipal Source Water Suppliers
 - Identifying and Contacting
 - Assessing Worse-Case Scenario

C. Surveillance

DOMAIN V: Water Purification Equipment (20%)

A. Materials of Construction/Compatibility

B. Backflow Prevention

C. Tempering Valves

D. City Water Booster Pumps

E. Filtration

F. Carbon Adsorption

G. Softening

- Ion Exchange
- Descaling

H. Primary Purification Method

- Reverse Osmosis
 - Central RO
 - Portable RO (PRO)
 - Membranes
- Ion Exchange
 - Mixed Bed Deionizers
 - Dual Bed Deionizers

I. Other Equipment

- UV Systems
- Chemical Injection Systems
- Organic Scavengers
- Dealkalizers
- Heat Exchangers
- Chillers
- CIP Tank

J. Treated Water Distribution Systems

- Types
 - Direct
 - Indirect
- Components
 - Piping
 - Storage Tanks
 - Repressurization Pumps

- Ultrafilters
- Wall Stations
- Di Bypass Systems

K. Dialysis Water System Design

- Feed Water Onsite Analysis
- Evaluation of Feed Water Quality
- Seasonal Variations
- Worse-Case Scenario Considerations
- Equipment Selection and Sizing
- Final Configuration

L. Selecting a Medical Device Water Treatment Equipment Vendor

- Preparing a Request For Proposal (RFP)
 - Quality and Quantity Requirements
 - Feed Water Quality Analysis
 - Preferred System Configuration
 - Proposed Equipment and System Features
 - Installation, Validation, Training, and Support Services
 - Evaluation of Bids Submitted
 - Conclusions

DOMAIN VI: Water System Performance and Monitoring (15%)

A. Water Contaminants

- Chemical Contaminants
 - Organic
 - Inorganic
- Microbiological Contaminants
 - Bacteria
 - Viruses
 - Algae
 - Mold
 - Fungus
 - Biofilm

B. Standard Test Methods

- Microbiological Assays
- Titration
- Colorimetric
- Amperometric
- Polargraphic
- Other Assays
- Test Interferences

C. Types of Monitoring

- Automated vs. Manual
- Online Monitoring

- Off-line Monitoring
- Sample Collection

D. Evaluation of Equipment Performance

- Tempering Valve
- City Boost Pump
- Filtration
- Activated Carbon Filtration
- Ion Exchange Softener
- Reverse Osmosis Device
- Other Devices
 - Injection Systems
 - Organic Scavengers
 - UV Systems
 - Ultrafilters
 - Distribution Pumps
- Evaluation of Water System Performance - Trending
- Monitoring Schedules
- System Failures

DOMAIN VII: Disinfection Strategies and Prevention Practices (15%)

A. Installation

- Partnering with Water Equipment Vendor

B. Prevention: Getting a Good Start

C. Partnering with the Lab

- Identification
 - Bacteria
 - Viruses
 - Algae
 - Fungus
 - Molds
 - Normal Skin or Body Organisms

- Validating the System Disinfection Schedule

- Verifying the Effectiveness of Disinfectant

- Proper Sample Collection Procedures

D. Methods of Disinfection

- Chemical
- Heat
- Ozone

E. Standard Disinfection

F. High Level Disinfection

G. Presence Testing

H. Residual Testing

Remediation: Waterman to the Rescue

Suggested Reading Materials

Reference Guide

A variety of textbooks and publications are currently available to assist candidates in preparing for the examinations. The following is a list of suggested references for use in preparing for each of the BONENT examinations

A: CPDN, CHT, CHN.

1. **Core Curriculum for Nephrology Nursing** © 2008, 5th edition

2. **Contemporary Nephrology Nursing: Principles and Practice** © 2006, 2nd edition

3. **Applying Continuous Quality Improvement in Clinical Practice** © 2009

4. **Core Curriculum for the Dialysis Technician:**
A Comprehensive Review of Hemodialysis Fourth Edition

5. **American Heart Association, CPR Standards** © 2010

6. **ANSI/AAMI RD47:2008**
Reprocessing of hemodialyzers

7. **ANSI/AAMI/ISO 13959:2009**
Water for hemodialysis and related therapies

8. **ANSI/AAMI/ISO 11663:2009**
Quality of dialysis fluid for haemodialysis and related therapies

9. **Comprehensive Nephrology Nursing.** pp. 267-289.
Richard, C.J. (ed), Boston: Little, Brown and Company, 1986.

10. **Handbook of dialysis** [Book]
John T. Daugirdas, Peter Gerard Blake, Todd S. Ing, (2006)

11. **Review of Hemodialysis for Nurses and Dialysis Personnel**
Gutch, CF, Stoner, MH, Correa, A. (2005) 7th edition

12. **Textbook of Peritoneal Dialysis**
Nolph R and Gokal, R, Krediet, R - Apr 24, 2009

13. **Peritoneal dialysis**
Napier M. Thomson, Peter C. Farrell

14. **Dialysis therapy**
Nissenson AR, Fine RN, (2007)

15. **Clinical Dialysis**
Nissenson AR, Fine RN, (2005)

16. **A Study Guide for Dialysis Technologists**
Varughese, P. Orsini-Negron and Andrysiak, P. 4th Ed.

17. **Dialysis Technology: A Manual for the Dialysis Technician**
3rd edition, Varughese, P, Curtis, J

Continued on Page 21

NANT Manuals and Study Guides

Dialysis Technology: A Manual for Dialysis Technicians, Third Edition (NT-S201)

A Study Guide for Dialysis Technologists, Fourth Edition (NT-S102)

Water Treatment for Hemodialysis (NT-P102)

Go to www.NANT.biz to purchase these publications.

B. CHBT

1. **Association for the Advancement of Medical Instrumentation (AAMI)**
RD 52, DR 62, RD5

2. **Centers for Medicare & Medicaid Services:**
ESRD Core Survey Field Manual
Interpretive Guidelines for Dialysis

3. **Review of Hemodialysis for Nurses and Dialysis Personnel, 1999 Vol., 6th Edition**
C.F. Gutch, Martha H. Stoner, Anna L. Corea

4. **Dialysis Technology: A Manual for Dialysis Technicians, 3rd Edition**
Curtis, J., & Varughese, P, 2003, National Association of Nephrology Technicians

5. **Life Safety Code 2012**

6. **The Basics of Hemodialysis Equipment**
Hemodialysis International 2005, Madhukar MISRA

7. **Monitoring Your Dialysis Water Treatment System**
June 2005, Northwest Renal Network, www.nwrenalnetwork.org

8. **Occupational Safety and Health Standards**

9. **Water Treatment for Hemodialysis** May 2005

C. CHWS

1. **AAMI/ANSI Standard**

2. **Deionization Basics**, Water Quality Association, 1996.

3. **FDA Water Treatment Manual**

4. **Ultrafiltration for the Water Quality Improvement Industry**. Haug, I.M., Water Quality Association, 1991.

5. **Fundamentals of Fluid Filtration: A Technical Primer, 2nd ed.** Johnston, P.R. 1990.

6. **Coagulants and Flocculants: Theory and Practice**. Kim, Y.H., Tall Oaks Publishing, 1995.

7. **Water Processing, 3rd ed.** McGowan, W., Water Quality Association, 2000.

8. **Pharmaceutical Water Systems**. Meltzer, T.H., Tall Oaks Publishing, 1997.

9. **Basic Principles of Water Treatment**. Morrelli, C.D., Tall Oaks Publishing, 1996.

10. **Reverse Osmosis for Point-of-Use Application**. Water Quality Association, 2001.

11. **The Nalco Water Handbook, 3rd ed.** Daniel J. Flynn (Ed.). Nalco Company: McGraw Hill, 2009.

12. **Water Filtration for Point-of-Use Application**. Water Quality Association, 1998.

13. **Water Treatment Fundamentals, 7th ed.**, Water Quality Association, 2004.

Take the Online BONENT
CHT Practice Exam
Visit www.BONENT.org

For More Information
Visit Our Web Site:


www.BONENT.org 



Certification Exam Application

1-1-21



Instructions

1. Complete ALL sections of the application. Please type or print legibly in blue or black ink.
2. You must sign and date the application form.
3. Your immediate supervisor must sign and date the verification section of this application.
4. Submit two signed and dated reference letters. Both letters MUST include your full legal name and verify:
 1. Length of total nephrology experience (past and present).
 2. Character **3**. Job duties (*job descriptions attached to reference letters will not be accepted*). One letter must come from your immediate supervisor (the same person who signs the verification section of this application), the second from a professional in nephrology (physician, technician, nurse, or dietitian).
5. If the name on your high school diploma or nursing license does not match your current legal name, you must list your previous name(s) in the space provided on the application and provide court documentation (i.e. marriage certificate or name change application) for each name change.
6. If you choose to pay by credit card, please complete the credit card payment information section of this application.
7. Mail the completed original, signed and dated application form, other paperwork as required and the examination fee to the BONENT Executive Office. (do not send cash)
8.  Application must be received no later than the published deadline date. Late applications will be returned unprocessed.
 • Indicate the date and site of the examination that you wish to take.

Paper & Pencil Exam

Exam-Specific Documents Required:

- All Technician applicants or Water Specialist applicants (with 3 years of dialysis water experience):** photocopy of your high school diploma or official high school transcript (with principal's signature and/or school seal) and/or documentation of completion of post-high school education if applicable.
 - **BioMed applicants:** BioMedical (BM) dialysis training certificates.
 - **Ohio CHT Applicants:** Must submit Form C with this application.
- Nurse applicants:** photocopy of your current, valid nursing license with the expiration date clearly visible.
 - **LVN/LPN applicants:** written verification of two years of experience in ESRD in a nursing capacity.
- Water Specialist applicants:**
 - **1 year of dialysis water experience:** photocopy of your Bachelors/ baccalaureate degree or proof of current certification (BONENT: CHT/CHBT; NNCO: CCNT/CBNT; or NNCC: CCHT) or a healthcare credential (e.g., nursing, physician assistant, pharmacist)
 - **2 years of dialysis water experience:** photocopy of your Associates degree or official college transcript.

Country	 Paper & Pencil Exam	 Computer Based Testing
USA	\$225	\$250
International** <small>(locations outside the US)</small>	\$250	\$250

**US dollars only (credit card or money order)

Application must be filled out by Applicant ONLY! (Please print clearly to avoid a delay in processing your application)

Name Mr. Ms. _____
Complete Current Legal Last Name / Surname (Jr, Sr, III, etc.) Previous Legal Last Name(s) / Surname(s) Legal First Name / Given Middle Name

Home Address _____
Street Apt. #

City State Zip Country

Work Phone () _____ Home Phone () _____ Cell () _____

E-mail _____ Social Security # _____ Date of Birth ____/____/____

Are you restricted from providing patient care by any state or federal agency? Yes No

Has your state medical license ever been suspended, revoked, or under investigation/restriction? Yes No N/A

Payment Information: **Check/Money Order:** Make payable to BONENT (DO NOT SEND CASH)

Credit/Debit Card (Check one): MasterCard Visa AMEX

Credit/Debit Card Number _____ Exp. Date _____ Security Code _____

Cardholder's Name as it appears on card (PRINT) _____

I authorize BONENT to charge my credit card \$ _____ (enter the total amount you are paying on this line)

Cardholder's Signature _____ Date _____

DO NOT FAX This Application!

BONENT Office Use Only:

PM _____ # _____ Amt. _____ I _____ D _____

Contact Us


Contact the BONENT Executive Office at (202) 462-1252 if you have questions about the application process or the application deadline.


Which BONENT exam do you want to take?

Certified Hemodialysis Technologist/Technician (CHT)
 CHT Spanish

Certified Hemodialysis BioMedical Technician (CHBT)
 Certified Hemodialysis Nurse (CHN)
 Certified Peritoneal Dialysis Nurse (CPDN)
 Certified Hemodialysis Water Specialist (CHWS)

How do you want to take the exam?

 (You must schedule your exam and location online after receipt of a BONENT Confirmation Letter)

 See Schedule on BONENT Website & list choice below:
 Site _____
 City _____ State _____ Date _____

Current Professional Category

RN LPN/LVN Patient Care Technician Water Specialist
 Equipment/Machine Technician Other _____

Number of Years in Nephrology:
 6-11 months One year 2 to 3 years 4 or more

Highest Level of Education Completed (Attach a copy of your diploma/certificate of completion or official transcript.)
 High School GED Bachelors Other _____

Other Experience BioMedical Water
 From (mo/yr) _____ to _____

Employment
 You must have the minimum required work experience to take a BONENT exam.


Current Nephrology Employment (List nephrology-related employment beginning with present employment.)

From (mo/yr) _____ to _____
 Company _____
 Position _____ Hrs/Wk _____
 Describe major duties and responsibilities.

Past Nephrology Employment

From (mo/yr) _____ to _____
 Company _____
 Position _____ Hrs/Wk _____
 Describe major duties and responsibilities.

Employment or Approved Training Program Verification Your current supervisor must complete, sign and date this section to confirm that the employment information listed above is correct. If you are applying based on completion of a BONENT Approved Training Program, the main instructor or program director must complete this section.

 **Current Supervisor*/ Approved Program Instructor MUST complete this entire section & sign.** *If you are unemployed but have the minimum required experience, your last facility supervisor must complete this section and write a reference letter. All other stated requirements apply.

 Current Supervisor / Approved Program Instructor (please print or type) Title

 Facility Name Facility Address City State Zip Country

 Phone Signature Date

Additional Fees	
Incomplete Application Penalty	\$65
Exam Withdrawals & Transfers	\$110
Returned Check Fee	\$80

Confidentiality
Official Board policy states that the BONENT Executive Office:

- Can only speak to exam applicants regarding application details.
- May not discuss any application with managers, supervisors educators, co-workers or family members.

Incomplete by Deadline: If you submit an incomplete application and fail to provide documents requested by the BONENT Executive Office by the given deadline, you will not be allowed to take the exam for which you are applying.

Read before signing this application: I understand that the Board of Nephrology Examiners Nursing Technology, Inc., Certification Board reserves the right to verify any or all information on this application. I understand that the information accrued in the certification process may be used for statistical purposes and for evaluation of the certification program and that the information from my certification records shall be held in confidence and shall not be used for any other purpose without my permission. I hereby authorize the Board to request information concerning me from any of the persons or organizations referred to in this application. I further understand that BONENT Certification depends upon meeting the eligibility requirements stated herein as well as achieving a passing score on the appropriate BONENT examination. If I achieve certification, I agree to pay such fees and meet such standards as are prescribed by the Board of Nephrology Examiners Nursing Technology, Inc., to maintain my certification status. I understand that BONENT maintains a registry of all BONENT-certified practitioners and that, should I become BONENT certified, my name and professional category will appear in this registry as long as my certification remains current. Upon successful completion, I authorize BONENT to verify my current status regarding my certification. I hereby state that to the best of my knowledge, I meet the eligibility requirements for this examination and that the information contained in this application is true, complete, correct and is made in good faith. I understand that any falsification in this application will be grounds for rejection of my application for certification or revocation of any certification issued. By signing this application, I authorize BONENT to post my application status on the BONENT Website.

 Applicant's Signature

 Date

Mail Original, Signed And Dated Application Only (NO Photocopies · NO Faxes)

For More Information
Visit Our Web Site:

www.BONENT.org 



**Board of Nephrology Examiners
Nursing & Technology, Inc.**

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