



Examination of Special Competence in Advanced Perioperative Transesophageal Echocardiography (Advanced PTEeXAM®) Handbook

Tuesday, July 23, 2024

Apply online at www.echobords.org

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Advanced PTEeXAM Important Dates

IMPORTANT!

Registration will end at 11:59 PM EDT (GMT-4) on Tuesday, May 28, 2024.

Early Registration Fee Ends **Tuesday, February 13, 2024**
at 11:59 PM Eastern Daylight Time
\$995.00 USD

Late Registration Fee Begins.....**Wednesday, February 14, 2024**
at 12:00 AM Eastern Daylight Time
\$1195.00 USD
(includes \$200.00 non-refundable late fee)

Withdrawal/Refund Deadline..... **Tuesday, July 2, 2024**
at 11:59 PM Eastern Daylight Time

Examination Date **Tuesday, July 23, 2024**

Scores Emailed (Anticipated) **Approximately 12 weeks**
following the examination

Requests for Special Accommodations Deadline..... **Tuesday, May 28, 2024**

Examination Administration Grievance Policy. See page 7 for more details.

Introduction

National Board of Echocardiography, Inc.®

The National Board of Echocardiography, Inc. (NBE) was formed in December 1998. The NBE is a not-for-profit corporation established to:

- develop and administer examinations in the field of Perioperative Transesophageal Echocardiography,
- recognize those physicians who successfully complete the Examination of Special Competence in Advanced Perioperative Transesophageal Echocardiography (Advanced PTEeXAM), and
- develop a board certification process that will publicly recognize as Diplomates of the National Board of Echocardiography, Inc. those physicians who have completed training programs or significant practice experience in the perioperative care of surgical patients with cardiovascular disease and in advanced perioperative transesophageal echocardiography (TEE), as specified in this application, and have additionally passed the Advanced PTEeXAM.

The examination and board certification in advanced perioperative transesophageal echocardiography is not intended to restrict the practice of echocardiography. The process is undertaken, rather, in the belief that the

public desires an indication from the profession regarding those who have made the effort to optimize their skill in the performance and interpretation of cardiac ultrasound.

The first examination in perioperative transesophageal echocardiography was given under the auspices of the Society of Cardiovascular Anesthesiologists (SCA) as a field test in 1997. An examination of perioperative transesophageal echocardiography was given in 1998, again under the SCA, and annually since then under the NBE. Physicians who successfully passed the exam were certified as having successfully completed the perioperative transesophageal echocardiography examination. Board certification was not granted since applicants were not requested to supply information regarding successful completion of training dedicated to the perioperative care of surgical patients with cardiovascular disease nor completion of special training in perioperative transesophageal echocardiography. With a mature and well-tested examination, a well-defined body of knowledge, published training guidelines, and published continuing quality improvement guidelines, the NBE began offering board certification in 2004.

Eligibility

Advanced PTEeXAM

Candidates for the Advanced PTEeXAM must provide proof that they can practice medicine (MD, DO, MBBS, etc.). Please see the examination eligibility requirements below:

North American Trained Physicians must submit **ONE** of the following:

- A valid (unexpired) license to practice medicine with expiration date
 - Training or temporary licenses with valid expiration dates are accepted
- Letter of Good Standing from ACGME Accredited program director
 - Letter must be on official letterhead, be signed by director and be notarized.
 - See Sample Letter of Good Standing [here](#).

Non-North American Trained Physicians must submit **ONE** of the following:

- A valid (unexpired) license to practice medicine with expiration date

If your license does not contain an expiration date, you will need **ONE** of the following:

- An original letter from the Medical Council stating your license is permanent
OR
- An original certificate of good standing dated no more than 12 months prior to date application received.

All documentation must be supplied in English. If original documentation is not in English, a certified translation must be attached to each document. The examinee will be responsible for all costs associated with certified translation. Please allow yourself appropriate time if you need to obtain your medical license from a third party or translation is necessary.

NOTE: Only a copy of the Applicant's current proof to practice medicine or a letter from current program director, completed application, and application fee are required in order to sit for the Advanced PTEeXAM. Documentation for certification is not required when registering to take the Advanced PTEeXAM, however, you may submit your certification documentation at any time after applying for your exam.

Testamur Status

For licensed physicians not meeting the criteria for certification, the NBE will continue to allow access to the examination. This is to encourage physicians to test and demonstrate their knowledge of advanced perioperative transesophageal echocardiography based on an objective standard and to allow the medical community the opportunity to recognize individuals who elect to participate in and successfully complete a comprehensive examination in advanced perioperative transesophageal echocardiography. Those who successfully pass the examination, will be granted Testamur status as having successfully completed the Examination of Special Competence in Advanced Perioperative Transesophageal Echocardiography of the National Board of Echocardiography, Inc.

Certification

Licensed physicians who meet the criteria for certification may apply for certification at the time of application for the Advanced PTEeXAM. The certification application, checklist, and all required documentation can be submitted at any time but is not required to register for the Advanced PTEeXAM.

The Certification Committee will meet to review applications for certification. Applicants will be notified in writing of the decision of the Committee. Review of application for certification will be contingent on successful completion of the Advanced PTEeXAM. Applicants will receive notification of the decision of the committee within the year.

Individuals who previously passed the Advanced PTEeXAM may apply for certification at any point in which they meet the clinical experience requirements as long as their testamur status remains valid.

Scope of Practice

The application of an advanced perioperative TEE examination is to utilize the full diagnostic potential of perioperative TEE including direction of the perioperative surgical decision-making process.

Application Details

Fees and Deadlines

Early Registration Fee Ends:
Tuesday, February 13, 2024 at 11:59 PM EDT
\$995.00 USD

Late Registration Fee Begins:
Wednesday, February 14, 2024 at 12:00 AM EDT
\$1195.00 USD
(includes \$200.00 non-refundable late fee)

Refund/Cancellation Deadline:
Tuesday, July 2, 2024 at 11:59 PM EDT

IMPORTANT!
Registration will end promptly at 11:59 PM EDT
on Tuesday, May 28, 2024

Submitting Applications

Please visit www.echoboards.org to complete the online registration.

If you have any questions, please contact NBE for assistance. Our information is below.

To contact our office:

Phone: (919) 861-5582
E-mail: info@echoboards.org
Web site: www.echoboards.org

Confirmation of Receipt of Application

It is recommended that you submit your online registration as early as possible. Registrations will be verified and completed in the order in which they are submitted. We will make every effort to accommodate as many candidates as possible. Registrations that are incomplete, or do not include payment will not be processed.

You will receive a confirmation email from NBE once your medical license or letter of good standing has been received and verified.

Please allow 2-6 weeks after submission of your online registration and payment for this to be completed. A valid e-mail address is required for confirmation.

Refund/Cancellation Policy

Candidates who wish to cancel/withdraw their registration and receive a partial refund (exam fee paid minus \$200.00) MUST submit a written request to cancel/withdraw via email to examination@echoboards.org on or before Tuesday, July 2, 2024.

Any requests received after this deadline will not be processed.

Deferments are no longer an option. We apologize for any inconvenience.

*** NOTICE ***

It is REQUIRED to provide NBE with a copy of your appointment cancellation from Pearson VUE prior to receiving a refund.

IMPORTANT!

Please remember to enter your name on the application in the SAME way as it appears on the unexpired, photo-bearing, signed, government-issued identification you will be using at the Prometric Testing Site. The name you provide on the application will be used to create the Scheduling Permit. Discrepancies in your first and last names will cause you to be denied admittance to the examination. Middle name(s) or initial(s) are not considered at the test center on exam day.

Examination Information

Examination Date

Tuesday, July 23, 2024

Pearson VUE Testing Center Information

The examination will be administered at Pearson VUE Testing Centers globally. All Pearson VUE Testing Centers are setup similarly. This not only helps enhance security, but also provides uniformity for all candidates. Workstations at all Pearson VUE test centers available to host the NBE examinations conform to Board-approved specifications.

Candidates are encouraged to submit registrations early. Candidates will not be able to schedule their test until their registration is complete and their Authorization to Test (ATT) notification has been received.

Visit home.pearsonvue.com/nbe to search for Testing Centers by location.

Please see page 7 for Exam and Test Center Policies and Procedures.

Determination of Passing Score

The passing score is based on an expected level of knowledge in echocardiography; therefore candidates are not measured against each other, but rather against the minimal level of knowledge established by the NBE.

All candidates will receive an emailed score report that indicates the minimum score required to pass the examination. The score reports also list the examinee's performance on each of the main areas of the examination.

Total score and performance scores for each section of the examination will be reported only to the examinee. A list including candidates who pass the exam, year that exam was passed, city and state, along with board certification status will be posted on the NBE web site. The Society of Cardiovascular Anesthesiologist (SCA) and the American Society of Echocardiography (ASE) will be supplied the names of those who pass the exam.

The score reports are emailed approximately twelve (12) weeks after the exam date. Certificates for passing the exam will be available to view and print on demand from NBE user profiles.

RESULTS WILL NOT BE GIVEN OVER THE TELEPHONE, VIA E-MAIL, or VIA FAX.

Frequently Asked Questions

Please visit our web site at www.echobords.org for answers to frequently asked questions. Sample letters to document education and experience in the required format are also available to download.

Notification of Change of Mailing Address or Email

Please notify the NBE immediately if your mailing and/or email address has changed since applying for the Advanced PTEeXAM. Email is NBE's preferred method of communication; therefore, failure to do so will cause delay in receiving correspondence from the NBE. You may submit your change of address on our website at www.echobords.org.

Special Accommodations

NBE will provide, upon approved request, reasonable accommodations necessary to afford an individual with a documented disability an equal opportunity to participate in the Advanced PTEeXAM. To support a request for special accommodations, please provide an original letter signed by the applicant and an evaluator, qualified psychologist, physician, or other health care professional who specializes in the stated disability. The documentation must:

- Be current (completed within the last five years)
- Clearly state the diagnosed disability or disabilities
- Describe the functional limitations resulting from the disability
- Describe the specific accommodations requested and the rationale for such accommodations
- Be typed or printed on official letterhead and signed by the evaluator qualified to make the diagnosis
- Include examples, when possible, of where special accommodations have been requested and granted. If no prior accommodations have been provided, the evaluator, psychologist, physician, or health care professional should include a detailed explanation as to why no accommodations were given in the past and why the accommodations are needed now.

The purpose of the documentation is to validate that the candidate is covered under the ADA as a disabled individual. Additional documentation may be required to support the request. All documentation submitted in support of a request for special accommodation will be kept confidential.

If breastfeeding/pumping accommodations are needed, please choose YES in the online application.

Requests for special accommodation must be received at NBE headquarters on or before Tuesday, May 28, 2024.

(continued on next page)

Examination Information (continued)

Examination Content Outline

1. Principles of Ultrasound

- A. Nature of Ultrasound: Compression and Rarefaction
- B. Frequency, Wavelength, Tissue Propagation Velocity
- C. Properties of Ultrasound Waves
- D. Ultrasound/Tissue Interactions

2. Transducers

- A. Piezoelectric Effect
- B. Crystal Thickening and Resonance
- C. Damping
- D. Sound Beam Formation
- E. Focusing
- F. Axial and Lateral Resolution
- G. Arrays

3. Equipment, Infection Control, and Safety

- A. Clinical Dosimetry
- B. Biological Effects of Ultrasound
- C. Electrical and Mechanical Safety
- D. Infection Control
- E. Transesophageal Echocardiographic Probe Insertion and Manipulation
- F. Contraindications to Transesophageal Echocardiography
- G. Complications of Transesophageal Echocardiography

4. Imaging

- A. Instrumentation
- B. Displays
- C. Imaging Modalities
- D. Signal Processing and Related Factors

5. Principles of Doppler Ultrasound

- A. Doppler Effect
- B. Doppler Equation
- C. Doppler Shift Frequencies and Influencing Factors
- D. Nyquist Limit
- E. Spectral Analysis and Display Characteristics
- F. Pulsed-Wave Doppler
- G. Continuous-Wave Doppler
- H. Color Flow Doppler
- I. Color M-Mode

6. Quantitative M-Mode and Two-Dimensional Echocardiography

- A. Edge Recognition
- B. Temporal Resolution
- C. Global Function

7. Quantitative Doppler

- A. Types of Velocity Measurements
- B. Volumetric Measurements and Calculations
- C. Valve Gradients and Areas
- D. Estimation of Pressures in the Cardiac Chambers and Great Vessels

8. Valvular Spectral Doppler Profiles

- A. Tricuspid Valve and Right Ventricular Inflow
- B. Pulmonic Valve and Right Ventricular Outflow
- C. Mitral Valve and Left Ventricular Inflow
- D. Aortic Valve and Left Ventricular Outflow

9. Cardiac Chamber Anatomy

- A. Imaging Planes
- B. Cardiac Chambers and Walls
- C. Cardiac Cycle and Relation of Events Relative to ECG

10. Global Ventricular Systolic Function and Pathology

- A. Assessment of Left Ventricular Systolic Function
- B. Abnormal Left Ventricular Systolic Function
- C. Assessment of Right Ventricular Function
- D. Cardiomyopathies

11. Segmental Left Ventricular Systolic Function and Pathology

- A. Myocardial Segment Identification (17-Segment Model)
- B. Coronary Artery Distribution and Flow
- C. Normal and Abnormal Segmental Function
- D. Left Ventricular Aneurysm
- E. Left Ventricular Rupture
- F. Ventricular Septal Defect Post Myocardial Infarction
- G. Left Ventricular Pseudoaneurysm

12. Cardiac Valves – Anatomy and Pathology (Excludes Spectral Doppler)

- A. Tricuspid Valve
- B. Pulmonic Valve
- C. Mitral Valve
- D. Aortic Valve and Root
- E. Acquired Valve and Annular Diseases

13. Intracardiac Masses and Devices

- A. Intracardiac Masses
- B. Devices and Foreign Material

14. Pericardium and Extracardiac Structures – Anatomy and Pathology

- A. Pericardium and Pericardial Space
- B. Pulmonary Arteries
- C. Pulmonary Veins
- D. Vena Cavae and Systemic Veins
- E. Coronary Arteries
 - 1. Anatomical position of coronary ostia
 - 2. Flow patterns
 - 3. Reimplantation buttons
- F. Aorta and Great Vessels
- G. Pleural Space and Lung
- H. Other Structures

15. Assessment of Perioperative Events

- A. Causes of Cardiovascular Instability
- B. Cardiopulmonary Bypass, including Minimally Invasive Management
- C. Ventricular Assist Devices and Intra-aortic Balloon Pumps
- D. Transplantation Surgery (Heart, Lung, Liver)
- E. Assessment related to Coronary Surgery
- F. Assessment related to Valve Surgery
- G. Assessment related to Aortic Surgery (Aneurysm)

16. Congenital Heart Disease

- A. Identification of Morphologic Left and Right Structures
- B. Assessment Post Surgical Repair
- C. Atrial Septum
- D. Ventricular Septum
- E. Pulmonic Valve and Right Ventricular Outflow Tract Abnormalities
- F. Aortic Valve and Left Ventricular Outflow Tract Abnormalities
- G. Coronary Artery Anomalies
- H. Patent Ductus Arteriosus
- I. Coarctation of the Aorta
- J. Ebstein's Anomaly
- K. Persistent Left Superior Vena Cava
- L. Tetralogy of Fallot
- M. Transposition of the Great Arteries
- N. Atrioventricular Septal Defect
- O. Single Ventricular Procedures
- P. Truncus Arteriosus
- Q. Cor Triatriatum

17. Artifacts and Pitfalls

- A. Two-dimensional Imaging Artifacts
- B. Doppler Artifacts and Errors in Measurement
- C. Pitfalls (Normal Anatomy/Variants Mistaken for Pathology)

18. Related Diagnostic Modalities

- A. Epiaortic Scanning
- B. Epicardial Scanning
- C. Contrast Echocardiography
- D. Utility of TEE Relative to Other Diagnostic Modalities

19. Ventricular Diastolic Filling and Function

- A. Basic Principles
- B. Echocardiographic Assessment of Left Ventricular Diastolic Function
- C. Grading of Left Ventricular Diastolic Function
- D. Estimates of Left Ventricular Diastolic Filling Pressures
- E. Right Ventricular Diastolic Function

20. Transesophageal Echocardiography for Interventional/Hybrid Procedures

- A. Intracardiac and Extracardiac
- B. Endovascular

Reference Statement

NBE does not endorse or recommend any third-party review course or material. Any text in cardiovascular techniques and evaluation, cardiac patient care, and management may be used. Current standards and guidelines endorsed by professional societies are also appropriate.

Exam and Test Center Policies and Procedures

Admission to the Test

You should arrive at the Pearson VUE test center 30 minutes before your scheduled testing time on your testing date. If you arrive late, you may not be admitted. If you arrive more than 30 minutes after your scheduled testing time, you will not be admitted.

Please visit <https://home.pearsonvue.com/Test-takers/Resources.aspx> for Pearson VUE exam day policies, procedures and test center expectations.

Testing Regulations and Rules of Conduct

Test center staff monitors all testing sessions for the examination. You must follow instructions of test center staff throughout the examination. Failure to do so may result in a determination of irregular behavior.

Test center staff are not authorized to answer questions from candidates regarding examination content, testing software, or scoring.

If staff observe you violating test administration rules or engaging in other forms of irregular behavior during the examination, the center staff will not necessarily tell you of the observation at the time of the examination. You may not bring any personal belongings in to the testing area. If you bring any personal belongings to the test center, you must store them in a designated locker outside the testing area. Personal items and their contents may be subject to inspection. Any materials that reasonably appear to be reproductions of any NBE examination materials will be confiscated. Making notes of any kind during the examination, except on the materials provided by the test center for this purpose, is not permitted. Removal of those materials from the secure testing area is prohibited.

For your examination, you may bring cordless soft-foam earplugs into the testing room. However, they must be out of the packaging and ready for inspection by test staff during check-in. Earplugs must be left at the workstation during all breaks.

Exam Administration

Occasionally issues arise in the creation, administration and scoring of examinations. For example, power failures, hardware and software problems, human error, or weather problems may interfere with some part of the examination process or delay the reporting of scores. When such problems arise, NBE may provide the affected candidates with an opportunity to take the examination at the next scheduled examination date. This shall be the candidate's sole remedy. NBE shall not be liable to any candidate for inconvenience, expense, or other damage, including administration, scoring of an examination, or delays in score reporting. In no circumstance will NBE reduce its standards or overturn the candidate's score as a means of correcting a problem in examination administration. Issues or problems arising during the administration of the examination must be reported to Pearson VUE test center staff by the candidate experiencing the issue or problem at the time the exam is being administered and prior to the candidate departing the test center site on the day the examination is scheduled. Candidates must also notify NBE of any issues or problems with the administration of the examination within 48 hours of candidate's scheduled examination time.

In the rare event of a technical problem, testing software is designed to allow the test to restart at the point it was interrupted. In most cases, the test can be restarted at the point of interruption with no loss of testing time.

Examination Administration Grievance Policy

If you wish to file a grievance regarding the administration of your examination, you must submit, in writing via email (examination@echoboards.org), a detailed description of the grievance(s) that occurred. You will have three (3) business days after the exam administration in question to submit your complaint(s) along with any appropriate or verifiable support-ing documentation to the NBE office via the email addresses listed above.

Approved NBE Exam Candidates

Upon the approval of an application, candidates are emailed an Authorization to Test (ATT) notification which will include your 1-day eligibility window to take the examination. The ATT provides instructions and details for scheduling your test date and location.

NBE's examinations are administered on only 1 day at over 230 Pearson Professional Centers (PPC) in the United States and US territories and over 3,000 Pearson VUE Authorized Test Centers (PVTC) internationally. Examination site availability is provided when scheduling your examination with Pearson VUE. Do not contact Pearson VUE until you have received an Authorization to Test (ATT). Available sites may be viewed at www.pearsonvue.com/nbe.

IMPORTANT: While the NBE tries to accommodate location preferences, preferred testing sites are NOT guaranteed, and travel may be necessary.

In the event you need to reschedule or cancel your examination, contact Pearson VUE within a full 48 hours in advance of your scheduled appointment.

- **Via phone** (\$10 fee): Call (800) 869-4102, 7:00 am to 7:00 pm, Central Standard Time, Monday through Friday (Outside of the U.S. (952) 681-3789).
- **Via internet** (no fee): Go to www.pearsonvue.com/nbe

IMPORTANT: If you do not contact Pearson VUE within a full 48 hours in advance of your scheduled appointment you cannot reschedule or cancel the examination and your fees will be forfeited. For any issues with your examination fees, you will need to contact NBE at info@echoboards.org.

Exam Day

The only people admitted into the examination room are

1. Test Administrators
2. Authorized Candidates

Identification (ID) Requirements

- The first and last name that the candidate uses to register must match exactly the first and last name on both ID's that are presented on test day.
- All ID's required must be issued by the country in which the candidate is testing. If the candidate does not have a qualifying primary ID issued from the country they are testing in, an International Travel Passport from their country of citizenship is required, along with a secondary ID.
- Candidate is required to present two forms of original (no photo copies), valid (unexpired) ID's; one form as a primary ID (government issued with name, recent recognizable photo, and signature) and one form as a secondary ID (with at least a name and signature, or name and recent recognizable photo).

Primary ID:

- International Travel Passport
- Driver's license
- Military ID (including spouse & dependents)
- Identification card (national/state/province identity card)
- Alien registration card (green card, permanent resident, visa)
- Local language ID (not in Roman characters) – accepted only if issued from the Country the Candidate is testing in

Secondary ID:

- Any ID containing at least name and signature, or name and recent recognizable photo that meets above ID requirement
- In Japan, a valid Blue Japanese Health Card is acceptable

[Click here to view Pearson VUE ID Policy.](#)