Ventricular Assist Device-Certification (VAD-C™)

Candidate Handbook

Table of Contents

All questions and requests for information about the durable **Ventricular Assist Device Certification Examination** should be directed to:

VAD-CB
UH South F7854B
1500 E Medical Center Drive SPC 5230
Ann Arbor, MI 48109-5230
Website: https://iccac.global/vad-c-

All questions and requests for information about **examination scheduling** should be directed to:

Psychological Services Incorporated (PSI)
18000 W 105th Street
Olathe, KS 66061-7543
Phone: (800) 211-2754
Website: Examschedule@psionline.com

About VAD-CB and VAD-C™ Certification

Creating a certification to validate the clinical expertise it takes to care for durable ventricular assist devices (dVAD) patients has been a goal of the International Consortium of Circulatory Assist Clinicians (ICCAC) since the inception of the society in 2007. In 2019, the VAD-CB (Ventricular Assist Device Certification Board) was created to begin the lengthy process of certification test development. In collaboration with Psychological Services Incorporated (PSI), an independent testing agency, as well as over 60 volunteers, the goal for the first series of examinations is to roll out September 1st, 2022. The purpose of this certification is to "validate the expertise of clinicians that care for the durable ventricular assist device population", and in turn will promote the highest standards possible in our specialty.

Independent Testing Agency

The VAD-CB has contracted with Psychological Services Incorporated (PSI) to assist in the development, administration, scoring and analysis of the ventricular assist device certification examination. For over 50 years, PSI has been known for their certification examination development for professional organizations.

Nondiscrimination Policy

The VAD-CB and PSI does not discriminate among candidates on the basis of age, gender, race, color, religion, national origin, disability, marital status or any other protected characteristics.

About the VAD-C ™ Examination

The VAD-C™ examination consists of 100 multiple choice questions, including 20 questions that are not scored but are pretested for future use. Candidates will have up to 2 hours (120 minutes) to complete the exam.

ICCAC Membership Not an Eligibility Requirement

Membership in the International Consortium of Circulatory Assist Clinicians (ICCAC) is not an eligibility requirement for sitting for the VAD-C™ certification.

VAD-C™ Eligibility Criteria

There are three primary criteria for candidacy certification. These include:
- Employed in a position that includes care for Left Ventricular Assist Device patients for **at least 1 year**. The employing health care organization is accredited in Quality and Safety and has a program that is certified (or affiliated with) in Ventricular Assist Devices by an approved Center for Medicare & Medicaid Services (CMS) agency (or international

equivalent), **-OR-** an entity that supports those organizations (with the exception of those that are solely pediatric and not able to be certified).

- Work in an applicable profession:
    - Registered Nurse (such as RN, LPN)
    - Advanced Practice Providers (such as Nurse Practitioner, Physician Assistant)
    - Physicians (such as MD, DO)
    - Perfusionist (such as CCP)
    - Biomedical Engineer (Bachelor's degree or above)
    - Equipment Specialist (Associates degree or above)
    - International Equivalent
- Applicant **MUST** hold a licensure in the respective field or equivalent educational degree

Name and Address Changes

As a candidate, you are responsible for notifying the VAD-CB should your name and/or address change at any time before or after you become certified. Failure to do so may result in not receiving important information necessary for certification or recertification.

Any name or address changes should be forwarded to (email) vadc@vadcoordinator.org.

You are responsible for renewing your certification prior to the expiration date, even if you do not receive a renewal notice.

Examination Fees

	Initial Cost of First Test	Retake Cost if Unsuccessful
Computer-Based Testing	$375 US	$75 US

This includes a non-refundable application fee of $62. Payment may be made by credit card through PSI when scheduling your exam.

Examination Preparation

Below are resources available to assist in your preparation to take the examination.

Available to ICCAC members only:

1. ICCAC Core Curriculum: The core curriculum is a comprehensive review of the care of advanced heart failure patients with VADs. It is available to ICCAC members only at iccac.global

2. PowerPoint Presentation PDF file from the Exam Preparation Development Committee: The exam preparation materials are intended to provide candidates with an overview of

the content that is the basis for exam questions. Review of these materials does not guarantee that candidates will pass the exam.

Available to the Public:
1. VAD-C ™ Certification Exam Preparation Document: This document was created by the exam preparation committee and is located at iccac.global under the "VAD-C Certification" tab. This document is more than 150 pages of outline regarding the blue print of the test.

Examination Blue Print Matrix

Section	Section Title and Subtitles	# of Questions
1	Pre-Operative Management	16
1A	Patient Assessment and Diagnostics	4
1A1	Indications for VAD Candidacy	
1A2	Absolute Contraindications for VAD Candidacy	
1A3	Relative Contraindications for VAD Candidacy	
1B	Cardiac Comorbidities	3
1B1	Arrhythmia	
1B2	Valve and Root Disease	
1B3	Intracardiac Thrombus	
1B4	Valvular Insufficiency	
1B5	Left Ventricular Cavity Dimension	
1C	Non-Cardiac Comorbidities	3
1C1	Pulmonary Hypertension	
1C2	Diabetes	
1C3	Neurological Disorders	
1C4	Malignancies	
1C5	Arterial Disease	
1D	Pre-Operative Optimization	3
1D1	Renal	
1D2	Hepatic and Gastrointestinal	
1D3	Pulmonary	
1D4	Coagulation	

1D5	**Metabolic and Endocrine**	
1D6	**Resolution of Active Infection**	
1E	**Operative Technique and Procedures**	**3**
1E1	**Sternotomy**	
1E2	**Thoracotomy**	
1E3	**Cardiopulmonary Bypass**	
1E4	**Concomitant Procedures**	
2	**VAD Management**	**26**
2A	**Pump Factors Affecting Flow**	**5**
2A1	**Cannula Position**	
2A2	**Pump Thrombus**	
2A3	**RPM**	
2A4	**Hematocrit**	
2A5	**Outflow-Graft Integrity**	
2B	**Physiological Factors Affecting Flow**	**5**
2B1	**Aortic Valve**	
2B2	**Hydration Status**	
2B3	**Tamponade**	
2B4	**Afterload**	
2C	**Power Sources for VAD**	**4**
2C1	**Direct Current (Battery) versus Alternating Current (Wall)**	
2C2	**Battery Hygiene**	
2C3	**Grounding**	
2D	**Parameters for VAD**	**4**
2D1	**Flow**	
2D2	**Power**	
2D3	**Speed**	
2D4	**Pulsatility/Peak-Trough**	
2E	**Driveline Management**	**4**
2E1	**Standard Dressing Supplies**	
2E2	**Stabilization**	

2E3	Velour-Burying	
2F	Safety Measures	4
2F1	Avoidance of Water Submersion	
2F2	Avoidance of Electrostatic Discharge	
2F3	Avoidance of Electromagnetic Fields (e.g., MRI, scrap-metal magnet, metal detectors)	
2F4	Availability of Power Sources	
2F5	Avoidance of High-Impact Activity (e.g., contact sports)	
2F6	Travel Considerations (e.g., electrical outlets, travel security)	
3	Peri-Operative Management	19
3A	Anticoagulation Management	3
3A1	Anticoagulation and Antiplatelet Medications	
3A2	Intravenous Anticoagulation	
3A3	Long-Term Anticoagulation	
3A4	Anticoagulation Metrics	
3A5	Factors affecting INR	
3A6	Bridging and Reversing	
3B	Post-Operative Hemodynamics	3
3B1	Shock	
3B2	Hemodynamics Parameters	
3B3	Right Ventricular Failure	
3C	Post-Surgical Care	3
3C1	Incision Management	
3C2	Arterial Blood Gas	
3C3	Blood Pressure	
3C4	Transition to Progressive Care	
3D	Driveline Exit Site	3
3D1	Aseptic Technique for Dressing Changes	
3D2	Exit Site Assessment and Diagnostics	
3D3	Modalities to Treat Exit Site Infections	
3D4	Adverse Outcomes of Exit Site Infections	

3E	Complications	7
3E1	Driveline Integrity/Fracture	
3E2	Pump Thrombosis	
3E3	Cerebrovascular Accidents	
3E4	Bleeding Diatheses	
3E5	Arrhythmias	
3E6	Valvular Insufficiency (e.g., aortic, tricuspid)	
4	Continuation of Care	19
4A	Community-Based Health Services	3
4A1	Healthcare Professionals (e.g., cardiology, dialysis, cardiac rehab, home health)	
4A2	Extended Care Facilities (e.g. acute, sub-acute, long-term)	
4A3	Outpatient Follow-Up	
4B	Pre-Hospital Emergency Management	3
4B1	Emergency Protocols (e.g., ACLS, BLS)	
4B2	Emergency Patient Assessment (e.g., hemodynamics, perfusion, device alarms)	
4B3	Emergency Transport (e.g., selecting destination, transportation methods)	
4B4	Emergency Management of Pump Stop (e.g., power loss, restart)	
4C	Myocardial Recovery	3
4C1	Testing for Myocardial Recovery	
4C2	Diagnoses Associated with Myocardial Recovery	
4C3	Medical Therapy Optimization to Promote Recovery	
4C4	Explant and Post-Explant Care	
4D	End-of-Life Care	4
4D1	Advanced Directives	
4D2	Ethics pertaining to End-of-Life Care	
4D3	Pump Deactivation	
4D4	Palliative Care	
4E	Quality of Life	3

4E1	Patient and Caregiver Education	
4E2	Patient and Caregiver Advocacy (e.g., goals of care, caregiver burden)	
4E3	Functional Status (e.g., ADLs, IADLs)	
4E4	Community-Based Support Systems (e.g., school, work, support groups)	
4F	**Transplant Eligibility**	**3**
4F1	Monitoring for transplant eligibility	
4F2	Optimizing for transplant eligibility	
4F3	Maintaining transplant eligibility	

Application Process

Applications are submitted on-line then reviewed by the Exam Candidate Review Committee (ECRC) to ensure candidates meet criteria. To submit an application, go to ICCAC.global and click on the "VAD-C Certification" tab.

Application for Computer-Based Testing Examination

The steps for application submission are as follows:
Application process
1. Go to ICCAC.global
2. Click the VAD-C Certification page
3. Select application google form
4. Complete every field on the form.
5. Click submit

Review process:
1. ECRC committee reviews each application
2. Approved applications are forwarded to PSI
3. PSI sends an email with information on scheduling date and location of exam

The exam date and location are scheduled online. Candidates sit for the exam at the test taking centers supported by PSI.

Scheduling an Examination

Once you have been approved and have received your letter from VAD-CB, soon after you will receive an email from PSI with instructions of how to schedule your examination online.

Online Scheduling

PSI sends emails to acceptable candidates with instructions on how to schedule the exam appointment. A unique VAD-C identification number is generated for each candidate it is found in the approval email. Once scheduled, each candidate will receive an email with the time and location of the Assessment Center. A confirmation notice is emailed.

Special Accommodations requests will need to be provided at the time of your application submission to the VAD-CB Exam Candidate Review Committee. The ECRC will then review the request and either approve or deny the request. If approved, PSI will be notified of this and after receiving the initial exam scheduling email from PSI, you will need to follow the instructions under "**Special Arrangements for Candidates with Disabilities**" to schedule your test with the approved accommodations.

See below for special arrangements for candidates with disabilities. You need to be prepared to submit your accommodation need verification prior to scheduling your exam. The special form to submit through PSI needs to be submitted at least 45 days prior to the desired examination date.

Special Arrangements for Candidates with Disabilities

PSI complies with the Americans with Disabilities Act (ADA) and strive to ensure that no individual with a disability is deprived of the opportunity to take the examination solely by reason of that disability. The ADA as defined by the ADA as a person who has a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such an impairment, or a person who is perceived by others having such a condition. PSI will provide reasonable accommodations for candidates with disabilities.

Candidates requesting special accommodations must submit their original request first to the ECRC of the VAD-CB for approval. This approval will be sent to PSI with candidate information. Once receiving your confirmation email to schedule your exam from PSI, please you will be directed to fill out the *Request for Special Examination Accommodations* form by going to: https://psi-cdexp.zendesk.com/hc/en-us/requests/new?ticket_form_id=360000991112. Further communication will come from PSI regarding scheduling your exam with the requested accommodations.

Wheelchair access is available at all established Assessment Centers. Candidates must advise PSI at the time of scheduling that wheelchair access is necessary.
   1. Candidates with visual, sensory, physical or learning disabilities that would prevent them from taking the examination under standard conditions may request special accommodations and arrangements and will be reviewed by PSI.
   2. PSI will review the submitted forms and will contact you regarding the decision for accommodations with plans to guide you in scheduling this exam.

Assessment Center Locations

PSI Assessment Centers have been selected to provide accessibility to the most candidates globally. A current list of United States-based PSI Assessment Centers are located at: https://apse.org/wp-content/uploads/2018/05/PSI-Test-Center-Network-Locations.pdf. Non-United States-based PSI testing centers are listed here: https://www.gisci.org/Portals/0/PDF%27s/PSI%20International%20Locations.pdf

Holidays

Examinations will not be offered on the following United States holidays:
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day (and July 5th)
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Holiday
Christmas Holiday
New Year's Eve Day

Rescheduling or Cancelling an Examination

To cancel or reschedule an exam call PSI Candidate Services at 800-211-2754. To reschedule, candidates must call at least 2 business days before the appointment. Please be advised that candidates must speak with a Candidate Services representative directly to confirm the new exam date. Voice Mail messages are not acceptable means to communicate the need to change the exam appointment. The following schedule applies.

Examination scheduled on…	PSI MUST be contacted by 3pm Central Standard Time to reschedule the Examination by the previous …
Monday	Wednesday
Tuesday	Thursday
Wednesday	Friday
Thursday	Monday

Friday	Tuesday

Missed Appointments and Cancellations

Exam and registration fees are forfeited for candidates that miss the exam appointment. Candidates who miss appointments will have to resubmit an application and pay the new fees. Conditions requiring a new application and fees:

- Failure to contact PSI at least two business days prior to rescheduling
- Reschedule a second time
- Late arrival to assessment center, 15 minutes late
- Failure to report to assessment center
- Discovery of personal belongings, as defined below, in the testing area will result in immediate dismissal from the assessment center, inability to take exam, and forfeit fees

Inclement Weather, Power Failure or Emergency

In the event of inclement weather or unforeseen emergencies on the day of an examination, PSI will determine whether circumstances warrant the cancellation, and subsequent rescheduling, of an examination. All scheduled candidates will receive notification following the examination regarding rescheduling or reapplication procedures. The examination will usually not be rescheduled if the Assessment Center personnel are able to open the Assessment Center.

Every attempt is made to administer the examination as scheduled; however, should an examination be cancelled at an Assessment Center, all scheduled candidates will receive notification following the examination regarding rescheduling or reapplication procedures.

If power to an Assessment Center is temporarily interrupted during an exam administration, your examination will be restarted. The responses provided up to the point of interruption will be intact, but for security reasons the questions will be scrambled.

Taking the Examination

Computer-Based Examination

The exam is administered via computer at PSI designated assessment centers. Computer/ typing skills are not necessary to sit for the exam. Report on time to the assessment center as candidates who report 15 minutes late will not be admitted and forfeit the appointment and fees.

Identification

On the day of your examination appointment, report to the Assessment Center no later than your scheduled testing time. Once you arrive at the location, look for signs indicating PSI Assessment Center check-in. To gain admission to the assessment center, you must present one

form of identification, with a current photograph. This form of identification MUST BE CURRENT (not expired), match the name registered through your application documents, and include your current name and signature. You will be required to sign a roster for verification of identity.

- Examples of identification may include: driver's license; state identification card with photograph; passport; or military identification card with photograph.
  - This form of identification also is required to have a signature
- If the name on this document is DIFFERENT than it appears on your identification, you MUST bring proof of your name change (e.g., marriage license, divorce decree or court order).
- You will NOT be permitted to sit for your scheduled examination if your name on your identification does not match EXACTLY as your name on your candidate application (e.g., name on application says Tommy Nuance and your identification says Thomas Nuance).
- Candidates need to check identification documents during the application process and ensure that the application matches the identification.

Security

PSI administration and security standards are designed to ensure all candidates are provided the same opportunity to demonstrate their abilities. The Assessment Center is continuously monitored by audio and video surveillance equipment for security purposes.

The following security procedures apply during the examination:
- Examinations are proprietary. No cameras, notes, tape recorders, Personal Digital Assistants (PDAs), pagers or cellular phones are allowed in the testing room. Possession of a cellular phone or other electronic devices is strictly prohibited and will result in dismissal from the examination.
- No calculators are allowed.
- No guests, visitors or family members are allowed in the testing room or reception areas.

Personal Belongings

No personal items, valuables, or weapons should be brought to the Assessment Center. Only wallets and keys are permitted. Coats must be left outside the testing room. You will be provided a soft locker to store your wallet and/or keys with you in the testing room. You will not have access to these items until after the examination is completed. Please note the following items will not be allowed in the testing room except securely locked in the soft locker.
- Watches
- Hats

Once you have placed everything into the soft locker, you will be asked to pull out your pockets to ensure they are empty. If all personal items will not fit in the soft locker, you will not be able to test. The site will not store any personal belongings. If any personal items are observed in the

testing room after the examination has started, you will be dismissed and the administration of the exam will be forfeited.

Examination Restrictions

- Pencils will be provided during check-in.
- You will be provided with one piece of scratch paper at a time to use during the examination, unless noted on the sign-in roster for a particular candidate. You must return the scratch paper to the supervisor at the completion of testing, or you will not receive your score report.
- No documents or notes of any kind may be removed from the Assessment Center.
- No questions concerning the content of the examination may be asked during the examination.
- Eating, drinking or smoking will not be permitted in the Assessment Center.
- You may take a break whenever you wish but you will not be allowed additional time to make up for time lost during breaks.

Timed Examination

You will be allowed 120 minutes to take this examination.

Once checked in and settled at your designated computer, you will begin the timed examination. Before beginning, instructions for taking the examination are provided on your screen.

The computer monitors the time you spend on the examination. The examination will terminate if you exceed the time allowed. You may click on the "time" box in the lower menu bar on the screen or select the Time key to monitor your time. A digital clock indicates the time remaining for you to complete the examination. The Time feature may be turned off during the examination.

Only one examination question is presented at a time. The question number appears in the lower right of the screen. Choices of answers to the examination question are identified as A, B, C, or D. You must indicate your choice by either typing in the letter in the response box in the lower left portion of the computer screen or clicking on the option using the mouse. You may change your answer as many times as you wish during the examination time limit.

To move to the next question, click on the forward arrow (>) in the lower right portion of the screen or select the NEXT key. This action will move you forward through the examination question by question. If you wish to review any question or questions, click the backward arrow (<) or use the left arrow key to move backward through the examination.

An examination question may be left unanswered for return later in the examination session. Questions may also be bookmarked for later review by clicking in the blank square to the right

of the Time button. Click on the hand icon or select the NEXT key to advance to the next unanswered or bookmarked question on the examination. To identify all unanswered and bookmarked questions, repeatedly click on the hand icon or press the NEXT key. When the examination is completed, the number of examination questions answered is reported. If not all questions have been answered and there is time remaining, return to the examination and answer those questions. Be sure to provide an answer for each examination question before ending the examination. There is no penalty for guessing.

Candidate Comments

During the examination, comments may be provided for any question by clicking on the button displaying an exclamation point (!) to the left of the Time button. This opens a dialogue box where comments may be entered. Comments will be reviewed, but individual responses will not be provided.

Following the Examination

After completing the examination, you are asked to complete a short evaluation of your examination experience. Then you will be instructed to report to the examination proctor to receive an examination completion report. Please note, the first 100 or so test takers may experience a delay in receiving their scores due to internal analyses required at the initiation of the test.

Scores Cancelled by the VAD-CB or PSI

PSI is responsible for the validity and integrity of the scores they report. On occasion, occurrences such as computer malfunction, or misconduct by a candidate, may cause a score to be suspect. VAD-CB and PSI reserve the right to void or withhold examination results if, upon investigation, violation of its regulations is discovered.

All Examination Candidates

Failing to Report For An Examination

If you fail to report for an examination, you will forfeit the registration and all fees paid to take the examination. A new application form and examination fee are required to reapply for examination.

Misconduct

If you engage in any of the following conduct during the examination you may be dismissed, your scores will not be reported and examination fees will not be refunded. Examples of misconduct include the following:
- Create a disturbance, are abusive or otherwise uncooperative;

- Display and/or use electronic communications equipment such as pagers, cellular phones in the examination room
- Talk or participate in conversation with other examination candidates;
- Give or receive help or are suspected of doing so;
- Leave the Assessment Center during the administration;
- Attempt to record examination questions or make notes;
- Attempt to take the examination for someone else;
- Are observed with personal belongings; or
- Are observed with notes, books or other aids without it being noted on the roster.

Copyrighted Examination Questions

All examination questions are the copyrighted property of the VAD-CB. It is forbidden under federal copyright law to copy, reproduce, record, distribute or display these examination questions by any means, in whole or in part. Doing so may subject you to severe civil and criminal penalties.

Confidentiality

Information about candidates for testing and their examination results are considered confidential. Studies and reports concerning candidates will contain no information identifiable with any candidate, unless authorized by the candidate.

After the Examination

If You Pass the Examination

Each successful candidate will be sent an 8 ½ " x 11" certificate, certification wallet card and your one-of-a-kind VAD-C™ Lapel Pin. In addition, the candidate will be authorized to use the designation "VAD-C" demonstrating their success in passing the certification examination. Names of successful candidates will be posted to the ICCAC main webpage, at iccac.global.

If You Do Not Pass the Examination

Candidates who do not pass the examination are able to re-take the exam at a minimum of 45 days following the initial attempt, with the second attempt being before the end of the 90-day candidacy period in order to retake the examination at the reduced rate of $75. This reduced rate is non-refundable. Candidates who do not pass the second examination are considered a failed examination. Any repeat examination will require completion of a new application and payment of the full examination fee. There will only be a total of two attempts within the initial 90-day candidacy window determined by the ECRC of the VAD-CB.