



Cardiovascular Credentialing International

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Examination Overview

ACS – Advanced Cardiac Sonographer

The Advanced Cardiac Sonographer (ACS) credential was developed in response to a need to create a career track for sonographers who practice at an advanced level in the echocardiography laboratory. The ACS is committed to improving lab quality and efficiency through preparing preliminary echo assessments; performing advanced echocardiograms; mentoring fellows, students, residents, and staff; developing and implementing educational plans; facilitating continuous quality improvement; and coordinating cardiac ultrasound research.

CCI Announces New Pricing and Testing Window for Advanced Cardiac Sonographer (ACS) Examination

The ACS examination is administered only during the months of August and February each year.

Application Received by CCI	Examination Window (date range exam can be taken)
February 1, 2020 to June 30, 2020	August 1, 2020 to August 31, 2020
July 1, 2020 to December 31, 2020	February 1, 2021 to February 28, 2021

To be authorized to sit for the ACS exam, applicants must complete the following:

- Register for the exam through the CCI website (www.cci-online.org)
- Provide all supporting documentation
- Pay exam fee (\$450.00 USD)

Examination fees are subject to CCI's refund policy. Please refer to the [CCI Applicant Handbook](#) for more details.

Once approved, candidates will receive their Authorization To Test (ATT) that provides instructions on how to schedule their exam. The examination will be administered at Pearson Testing centers. Scheduling of testing appointments will continue to be done directly with Pearson and is on a first-come, first-served basis. The

earlier an application is submitted the better the chance of obtaining the preferred exam date, time, and location for testing during the desired exam window. All testing must be completed before the exam window closes. The exam will remain closed until a new exam window opens.

Candidates who are unable to take the exam on their scheduled date can reschedule within the testing window. There is no charge for rescheduling if done two full working days in advance of their scheduled appointment. If candidates do not reschedule the exam within two working days, they must either take their scheduled exam or forfeit their exam fees.

Candidates may elect to defer their unscheduled or cancelled exam eligibility to the following testing window. Candidates are only permitted to defer their exam eligibility one time.

The preliminary examination results letter/score report will continue to be provided onsite to the test-taker upon completion of the exam. Candidates will receive their official results from CCI approximately two to three weeks after taking their exam.

Please refer to the [CCI Applicant Handbook](#) for CCI's application policies and procedures.

Advanced Cardiac Sonographer (ACS)

This Examination Overview booklet is meant to assist you as a prospective candidate of the Advanced Cardiac Sonographer (ACS) credentialing program. It provides an overview of the Qualification Requirements and Examination Content. For more details on CCI policies, the testing process, and procedures to submit an application, please visit www.cci-online.org/acs to download the CCI Applicant Handbook which contains the application. **Examination fee is \$450 USD. All exam fees include a \$100 USD non-refundable filing fee.**

Qualification Requirements

All applicants must meet the following criteria:

1. Have a high school diploma or general education diploma at the time of application.
2. Fulfill one (1) of the qualifications of the exam for which you are applying. See qualifications listed in the table below.
3. Provide typed documentation to support the qualification under which you are applying. Required documentation for each qualification is listed below. CCI reserves the right to request additional information.

Qualification Prerequisite	Supporting Documentation
<p>ACS1</p> <p>A graduate of a programmatically accredited program in Advanced Cardiac Sonography.</p>	<p>ACS1</p> <p>A copy of a graduate certificate AND Student verification letter from the Advanced Cardiac Sonography educational program director.</p>
<p>ACS2 **</p> <p>A graduate of a programmatically accredited program in cardiac ultrasound/ echocardiography.* AND Hold an active echocardiography registry credential (includes but not limited to RCS, RCCS, or RDCS) AND Seven (7) years of cardiac ultrasound clinical experience as a registered echocardiography sonographer. It is anticipated, but not required, that the applicant have performed a minimum of 8000 echocardiograms in their career which is defined as work experience and/or formal clinical education program.</p>	<p>ACS2</p> <p>A copy of a graduate certificate from the programmatically accredited educational program. AND Copy of wallet card showing date earned and active through date of registry credential (RCS, RCCS or RDCS) AND Employment verification letter which indicates time period of employment and primary duties of applicant, and clinical competence related to the field of cardiac ultrasound.</p>
<p>ACS3 **</p> <p>A graduate of a diploma, associate, or baccalaureate academic program in health science (including, but not limited to, cardiovascular technology, ultrasound, radiologic technology, respiratory therapy, or nursing) AND Hold an active echocardiography registry credential (includes but not limited to RCS, RCCS, or RDCS) AND Seven (7) years of cardiac ultrasound clinical experience as a registered echocardiography sonographer.</p>	<p>ACS3</p> <p>A copy of a graduate certificate AND Copy of wallet card showing date earned and active through date of registry credential (RCS, RCCS or RDCS) AND Employment verification letter which indicates time period of employment and primary duties of applicant, and clinical competence related to the field of cardiac ultrasound.</p>
<p>ACS4 **</p> <p>Hold an active echocardiography registry credential (includes but not limited to RCS, RCCS, or RDCS) AND Ten (10) years of cardiac ultrasound clinical experience as a registered echocardiography sonographer. It is anticipated, but not required, that the applicant have performed a minimum of 8000 echocardiograms in their career which is defined as work experience and/or formal clinical education program.</p>	<p>ACS4</p> <p>Copy of wallet card showing date earned and active through date of registry credential (RCS, RCCS, or RDCS) AND Employment verification letter which indicates time period of employment and primary duties of applicant, and clinical competence related to the field of cardiac ultrasound.</p>

* An accredited program is accredited by an agency recognized by the Council for Higher Education Accreditation (CHEA), United States Department of Education (USDOE), or Canadian Medical Association (CMA), that specifically conducts programmatic accreditation for cardiovascular technology, diagnostic cardiac sonography, or vascular technology.

** It is CCI's goal to advance the standards for all cardiovascular professionals. CCI recognizes that the future demands for advanced-level sonographers will result in the need for additional education for sonographers who wish to earn the Advanced Cardiac Sonographer credential. CCI will continue to review the qualification prerequisites for candidates applying for the ACS examination. Through collaboration with the professional societies, educators, and the cardiac sonography community CCI will establish minimum educational standards for the Advanced Cardiac Sonographer credentialing program.

Advanced Cardiac Sonographer (ACS)

These examination matrices are provided to illustrate the general distribution of questions and the relative weight or emphasis given to a skill or content area on the examination.

Matrix for Exams Administered before February 1, 2021

Content Category	Approx. % of Exam
A. Performing Preliminary Echo Assessments	56%
B. Performing Advanced Echocardiograms	25%
C. Mentoring Fellows, Students, Residents, and Staff	3%
D. Developing and Implementing Educational Plans	8%
E. Facilitating Continuous Quality Improvement	6%
F. Coordinating Cardiac Ultrasound Research	2%
TOTAL	100%

Matrix for Exams Administered on or after February 1, 2021

Content Category	Approx. % of Exam
A. Assimilating History, Clinical, and Echocardiographic Findings	10%
B. Assessing Cardiovascular Heart Disease	40%
C. Assessing Valvular Heart Disease	15%
D. Evaluating Structural Heart and Interventional Procedures	15%
E. Utilizing Advanced and Multi-Modality Imaging	9%
F. Assessing Congenital Heart Disease	4%
G. Demonstrating Professional Practice	7%
TOTAL	100%

The task lists below describe the activities which an ACS is expected to perform on the job. All examination questions are linked to these tasks.

Task List for Exams Administered before February 1, 2021

Duties and Tasks	Approx. % of Exam
A Performing Preliminary Echo Assessments	56%
1 Review Echo Image Quality and Completeness	
2 Identify Cardiovascular Abnormalities	
3 Create Preliminary Echo Report	
4 Ensure Report Completeness and Accuracy	
B Performing Advanced Echocardiograms	25%
1 Ensure Patient Safety and Satisfaction	
2 Assimilate History and Clinical Findings	
3 Develop Echo Protocols	
4 Acquire Echo Images	
5 Tailor Echo Exam	
6 Perform Echo Measurements and Calculations	
C Mentoring Fellows, Students, Residents, and Staff	3%
1 Assess Mentees' Competence and Skills	
2 Provide Critical Feedback and Technical Guidance	
3 Assign Improvement Projects	
D Developing and Implementing Educational Plans	8%
1 Identify Desired Outcomes	
2 Prepare Educational Materials and Plan	
3 Deliver Educational Materials	
4 Measure Continued Performance	
E Facilitating Continuous Quality Improvement	6%
1 Develop CQI Program	
2 Implement CQI Processes	
3 Analyze CQI Results	
4 Execute an Action Plan	
5 Facilitate Echo Lab Accreditation	
F Coordinating Cardiac Ultrasound Research	2%
1 Identify a Research Topic	
2 Assist with Research Design	
3 Collect Research Data	
4 Analyze Research Data	
5 Disseminate Research Results	
TOTAL	100%

Task List for Exams Administered on or after February 1, 2021

Duties and Tasks	Approx. % of Exam
A Assimilating History, Clinical, and Echocardiographic Findings	10%
1 Perform patient assessment	
2 Integrate clinical history (signs, symptoms, medications)	
3 Integrate prior studies (e.g., echocardiography, ECG)	
4 Create preliminary echo report (including critical findings)	
5 Ensure report completeness and accuracy (e.g., IAC, ASE)	
B Assessing Cardiovascular Heart Disease	40%
1 Assess cardiomyopathies (e.g., hypertrophic, dilated, restrictive, infiltrative, stress)	
2 Assess cardiac masses (e.g., tumor, thrombus, artifact)	
3 Assess coronary artery disease	
4 Perform stress echo (ischemic and nonischemic)	
5 Assess pericardial diseases	
6 Assess heart failure (left and right)	
7 Assess diseases of the aorta	
8 Assess right heart and pulmonary hypertension	
9 Assess systemic arterial hypertension	
10 Assess systemic diseases	
11 Assess diastolic function	
12 Assess cardiac findings with special populations (e.g., athletes, pregnancy, aging, transplant)	
13 Assess chemotherapy related therapeutic dysfunction	
14 Assess mechanical circulatory support devices (e.g., VAD, ECMO, IABP, long- and short-term support)	
15 Assess cardiovascular heart disease with ultrasound enhancing agents	
16 Perform echo measurements and calculations and assess hemodynamics	
C Assessing Valvular Heart Disease	15%
1 Assess aortic valve disease	
2 Assess mitral valve disease	
3 Assess pulmonic valve disease	
4 Assess tricuspid valve disease	
5 Assess prosthetic valves	
6 Assess valvular endocarditis	
D Evaluating Structural Heart and Interventional Procedures	15%
1 Acquire pre-intervention qualitative and quantitative data specific to structural heart disease procedures (e.g., transcatheter valve repair, closure device, occluder device, surgical)	
2 Acquire post-intervention qualitative and quantitative data specific to structural heart disease procedures (e.g., transcatheter valve repair, closure device, occluder device, surgical)	
3 Evaluate surgical and transcatheter interventions	
4 Evaluate perioperative and procedural complications	
5 Evaluate functional effectiveness of procedure	
6 Compare multi-modality imaging	
7 Assist with image acquisition and recognize complications (e.g., TEE, ICE, 3D)	
E Utilizing Advanced and Multi-Modality Imaging	9%
1 Perform 3D imaging	
2 Perform strain imaging	
3 Integrate multi-modality cardiac imaging (e.g., MRI, CT, fluoroscopy, molecular)	
F Assessing Congenital Heart Disease	4%
1 Assess simple congenital heart disease pre- and post-repair (e.g., ASD, VSD, PDA, PFO, persistent left SVC, coarctation)	
2 Assess complex congenital heart disease pre- and post-repair (e.g., TGA, ToF, TV atresia, HLHS, syndromes)	
G Demonstrating Professional Practice	7%
1 Mentor fellows, students, residents, and staff	
2 Develop and implement educational plans	
3 Facilitate continuous quality improvement	
4 Interpret clinical research principles	
5 Assist with echo lab accreditation	
TOTAL	100%

Advanced Cardiac Sonographer (ACS)

Knowledge List

The list below describes general areas of knowledge that are needed in order to perform the tasks identified. This knowledge will apply across multiple tasks.

Acquired heart disease	Contrast Echo (e.g., LVO, MCE)	National guidelines and standards
Aortic Disease	Coronary and Ischemic Heart Disease	Pathology
Cardiac catheterization	CQI and performance improvement	Pericardial disease
Cardiomyopathies	Diastolic Function	Right Heart Disease
Complications (e.g., post procedural)	Educational Theory	Strain Echo
Cardiovascular hemodynamics	Heart Failure and Stroke	Systemic disease
Congenital heart disease (Simple and Complex)	Interventional procedures	TEE
	Mitral Valve Disease	

ACS References

The resources listed below are intended as recommended resources when preparing for examination. You may have previous or later editions of these or other references available that also present acceptable coverage of the subject matter. Any general text in cardiovascular techniques and evaluation, and cardiac patient care and management may be used. It is not necessary to use all of the texts identified. They are provided as suggestions only. CCI does not endorse or recommend any third-party review course or material.

1. **Publications and Reports of the American Society of Echocardiography (ASE)**, Raleigh, NC. All new ASE Guidelines published on www.asecho.org/Guidelines.
2. Anderson, Bonita. **A Sonographer's Guide to the Assessment of Heart Disease**. MGA Graphics.
3. Armstrong, William F., Thomas Ryan, and Harvey Feigenbaum. **Feigenbaum's Echocardiography**. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.
4. Weyman, Arthur. **Principles and Practice of Echocardiography**, 2nd ed. Lippincott Williams & Wilkins, 1994.
5. Klein, Allan, Asher, Craig. **Clinical Echocardiography Review: A Self-Assessment Tool**. Lippincott Williams & Wilkins.
6. Morrison, G. R., Ross, S.M., Kalman, H.K. & Kemp, J.E. (2011). **Designing Effective Instruction** (6th ed.). Somerset, NJ: John Wiley.

Online Self-Assessment Practice Examinations are available for purchase for self-evaluation purposes. It is important to note that the results of the self-assessment exam do not guarantee or indicate individual success on the CCI exam, nor should the self-assessment serve as the only means for preparing for the CCI examination. **To order the self-assessment examinations online visit www.cci-online.org.**

CCI Applicant Handbook is required reading prior to applying for a CCI exam. Included is important information regarding the application policies, CCI procedures, and the testing process. **Download at www.cci-online.org/applicanhandbook.**