



Commission on Accreditation of Allied Health Education Programs

Standards and Guidelines *for Cardiovascular Technology Educational Programs*

Essentials/Standards initially adopted 1985; revised in 2003

Adopted by the
American College of Cardiology Foundation
American College of Radiology
American Society of Echocardiography
Society for Vascular Ultrasound
Society of Cardiovascular Anesthesiologists
Society of Invasive Cardiovascular Professionals
and
Commission on Accreditation of Allied Health Education Programs

The Commission on Accreditation of Allied Health Education Programs (CAAHEP) accredits programs in cardiovascular technology education, upon the recommendation of the Joint Review Committee on Education in Cardiovascular Technology (JRC-CVT).

These accreditation **Standards** are the minimum measures of quality used in accrediting programs that prepare individuals to enter the profession of Cardiovascular Technology. The extent to which a program complies with these **Standards** determines its status of public recognition; the accreditation **Standards** therefore constitute the minimum requirements to which an educational program shall be held accountable. *Guidelines* provide further explanation of the **Standards**.

Standards are printed in regular typeface in outline form. *Guidelines* are printed in *italic* typeface in narrative form.

Preamble

The American College of Cardiology, American College of Radiology, American Society of Echocardiography, Society for Vascular Ultrasound, Society of Cardiovascular Anesthesiologists, Society of Invasive Cardiovascular Professionals and the Commission on Accreditation of Allied Health Education Programs cooperate to establish, maintain and promote appropriate standards of quality for educational programs for the cardiovascular technologist, and to provide recognition for educational programs which meet or exceed the minimum standards outlined in these **Standards**. These **Standards** are to be used for the development, evaluation, and self-analysis of Cardiovascular Technology programs. Lists of CAAHEP-accredited programs are published for the information of students, employers, educational institutions and agencies, and the public.

Description of the Profession:

Cardiovascular technology is an allied health profession specifically focused on the diagnosis and treatment of patients with cardiac and peripheral vascular disease. The technologist performs examinations at the request or direction of a physician. The technologist is proficient in the use of analytical equipment and sundry apparatus including placing such equipment on or into the patient, or placing the patient on the equipment, acquisition of diagnostic images, cognitive skills involving data measurement, professionalism for patient interactions, and knowledge of cardiac anatomy and pathophysiology.

Through subjective sampling and/or recording, the technologist proceeds with the examination to create an easily definable foundation of data from which a correct anatomic and physiologic diagnosis and/or treatment may be established for each patient.

The profession of cardiovascular technology encompasses four areas of diagnostic evaluation: 1) invasive cardiology; 2) noninvasive cardiology; 3) noninvasive peripheral vascular study; and 4) cardiac electrophysiology. The procedures performed by the cardiovascular technologist may be found in, but are not limited to, one of the following general settings:

Invasive cardiovascular laboratories, including cardiac catheterization, blood gas and electrophysiology laboratories;

Noninvasive cardiovascular laboratories, including echocardiography, exercise stress test and electrocardiography laboratories;

Noninvasive peripheral vascular studies laboratories including Doppler ultrasound, thermography and plethysmography laboratories;

Cardiac pacing and electrophysiology, including electrophysiology laboratories and pacemaker clinics.

I. Sponsorship

A. Sponsoring Institution

A sponsoring institution must be at least one of the following:

1. A post-secondary academic institution accredited by an institutional accrediting agency that is recognized by the U.S. Department of Education, and authorized under applicable law or other acceptable authority to provide a post-secondary program, which awards a minimum of an associate degree at the completion of the program.
2. A foreign post-secondary academic institution acceptable to CAAHEP.
3. A hospital or medical center or branch of the United States Armed Forces.

B. Consortium Sponsor

1. A consortium sponsor is an entity consisting of two or more members that exists for the purpose of operating an educational program. In such instances, at least one of the members of the consortium must meet the requirements of a sponsoring educational institution as described in I, A.
2. The responsibilities of each member of the consortium must be clearly documented as a formal affiliation agreement or memorandum of understanding, which includes governance and lines of authority.

C. Responsibilities of Sponsor

The Sponsor must assure that the provisions of these *Standards* are met.

II. Program Goals

A. Program Goals and Outcomes

There must be a written statement of the program's goals and learning domains consistent with and responsive to the demonstrated needs and expectations of the various communities of interest served by the educational program. The communities of interest that are served by the program include, but are not limited to, students, graduates, faculty, sponsor administration, employers, physicians, the public, and nationally accepted standards of roles and functions.

Program-specific statements of goals and learning domains provide the basis for program planning, implementation, and evaluation. Such goals and learning domains must be compatible with both the mission of the sponsoring institution(s) and the expectations of the communities of interest. Goals and learning domains are based upon the substantiated needs of health care providers and employers, and the educational needs of the students served by the educational program.

B. Appropriateness of Goals and Learning Domains

The program must regularly assess its goals and learning domains. Program personnel must identify and respond to changes in the needs and/or expectations of its communities of interest.

An advisory committee, which is representative of these communities of interest, must be designated and charged with the responsibility of meeting at least annually, to assist program and sponsoring institutional personnel in formulating and periodically revising appropriate goals and learning domains, monitoring needs and expectations, and ensuring program responsiveness to change.

C. Minimum Expectations

The program must have the following goal(s) defining minimum expectations: “To prepare competent entry-level cardiovascular technologists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains for invasive cardiology” and/or “To prepare competent entry-level cardiovascular technologists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains for non-invasive cardiology” and/or “To prepare competent entry-level cardiovascular technologists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains for non-invasive peripheral vascular” and/or “To prepare competent entry-level cardiovascular technologists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains for cardiac electrophysiology.”

Programs adopting educational goals beyond entry-level competence must clearly delineate this intent and provide evidence that all students have achieved the basic competencies prior to entry into the field.

Sponsors may select one, two, three, or all four of the above Minimum Expectation statements. Accreditation is considered only for the specific Minimum Expectation statement(s) designated by each program.

III. Resources

A. Type and Amount

Program resources must be sufficient to ensure the achievement of the program’s goals and outcomes. Resources include, but are not limited to: faculty, clerical/support staff, curriculum, finances, offices, classroom/laboratory facilities, ancillary student facilities, clinical affiliations, equipment/supplies, computer resources, instructional reference materials, and faculty/staff continuing education.

B. Personnel

The sponsor must appoint sufficient faculty and staff with the necessary qualifications to perform the functions identified in documented job descriptions and to achieve the program’s stated goals and outcomes.

1. Program Director

(a) Responsibilities

The Program Director must assure achievement of the program's goals and outcomes, and is responsible for all aspects of the program, including the organization, administration, continuous review, planning, development and general effectiveness of the program. The Program Director must provide supervision, administration and coordination of the instructional staff in the academic and clinical phases of the educational program.

(b) Qualifications

The Program Director must be a qualified faculty member and possess a higher level of education and/or professional experience than that for which the students in the program are being prepared. The Program Director must be registered in at least one of the cardiovascular specialties for which they assume a primary teaching role.

2. Medical Director

(a) Responsibilities

The Medical Director of the program must provide the input necessary to ensure that the medical components of the curriculum, both didactic and supervised practice, meets current standards of medical practice.

(b) Qualifications

The Medical Director must be a licensed physician, Board certified in the field that he or she is practicing, with recognized qualifications (by training and/or experience) in the diagnosis of cardiac and/or vascular disease and must be knowledgeable in teaching the subjects assigned.

3. Faculty and/or Instructional Staff

(a) Responsibilities

In classrooms, laboratories, and all clinical facilities where a student is assigned, there must be (a) qualified individual(s) clearly designated as liaison(s) to the program to provide instruction, supervision, and timely assessments of the student's progress in meeting program requirements.

All faculty members, regardless of the extent of their participation, should be familiar with the goals of the program and should be able to demonstrate the ability to develop an organized plan of instruction and evaluation.

(b) Qualifications

Instructors must possess appropriate credentials and knowledge in subject matter by virtue of training and experience, in teaching their assigned subjects.

Important criteria for employment of faculty should include: a) knowledge of subject matter; b) ability to organize and present the subject; c) positive attitude toward teaching; and d) participation in continuing education designed to improve instructional skills and maintain professional competence.

C. Curriculum

The curriculum must ensure the achievement of program goals and learning domains. Instruction must be an appropriate sequence of classroom, laboratory, and clinical activities. Instruction must be based on clearly written course syllabi describing learning goals, course objectives, and competencies required for graduation.

The curriculum evaluation method outlined by the JRC-CVT is one based on continuous quality improvement and outcome assessment. Programs should build into the evaluation process several intermediate and terminal outcome measures used to continuously monitor and adjust the curriculum and instruction methods to optimize student success.

The curriculum should include at least the three major areas of: a) Basic units of instruction; b) Cardiac and Vascular units of instruction; and c) Clinical instruction.

The core cardiovascular technology component of the curriculum should be derived from the cardiovascular technology professions themselves. To serve as guidelines, the professional societies have developed educational guidelines and/ or standards. These should serve as the driving source of the cardiovascular technology core curriculum and will be updated from time to time as the professions evolve.

For programs seeking accreditation in invasive cardiology, refer to the invasive portion of the “National Cardiovascular Technology Curriculum” published as “Guidelines for Educational Preparation and Staffing of Non-Physician Personnel in the Cardiac Catheterization Laboratory.” Cath Lab Digest, August 1999, vol. 7, no.8, page 1, or the most recent curriculum published by the Society of Invasive Cardiovascular Professionals.

For programs seeking accreditation in non-invasive cardiology, refer to the “Guidelines for Cardiac Sonographer Education: Recommendations of the American Society of Echocardiography (ASE) Sonographer Training and Education Committee,” Ehler et al (JASE 2001; 14:77-84) and/or echocardiography portion of the ASE approved Sonographer core curriculum, or the most recent curriculum published by the American Society of Echocardiography.

For programs seeking accreditation in non-invasive peripheral vascular refer to the “Standards for Undergraduate Educational Programs in Vascular Technology” by the Society of Vascular Technology or the most recent curriculum published by the Society of Vascular Technology.

For programs seeking accreditation in cardiac electrophysiology, refer to the “Standards of Professional Practice for the Allied Professional in Pacing and Electrophysiology” and/or the Educational Guidelines for Pacing and Electrophysiology, 3rd Ed. by Schurig, et. al or the most recent curriculum published by the North American Society of Pacing and Electrophysiology (Heart Rhythm Association).

Basic Units of Instruction

Suggested areas of instruction should combine both didactic instruction and structured laboratory experiences. The students should acquire a clear understanding of the basic sciences and how basic scientific principles relate to clinical applications in the cardiovascular technology field.

Suggested areas of instruction in the core curriculum:

- X *Introduction to the field of Cardiovascular Technology including patient care techniques and the hospital environment;*
- X *General and/or Allied Sciences including basic statistics and general mathematics at a level approaching that of intermediate algebra;*
- X *Human Anatomy and Physiology with emphasis on cardiac and vascular systems;*
- X *Basic Pharmacology pertaining to cardiovascular drugs; and*
- X *Basic medical Electronics and Medical Instrumentation.*

Related subjects may be selected from courses or course components in health care and general science that would meet established program objectives and goals and could enhance the professional ability of the cardiovascular technologist. These might include courses in reading comprehension, technical writing, research techniques, microbiology, interpersonal relationships, speech, and foreign language.

Students who have mastered the basic areas of instruction may be brought to a higher level of understanding and confidence with a mixture of the required physiology, and electrical, physical and clinical principles involved in the cardiovascular field; an opportunity should be provided to obtain the necessary level of knowledge and skills to properly operate and become familiar with diagnostic and physiological instrumentation used in their particular clinical area of specialization.

Cardiac and Vascular Units of Instruction

The cardiac units of instruction include three major areas: invasive and noninvasive cardiology, and cardiac electrophysiology. Programs training students to work in an environment where ionizing radiation is used must include units of instruction in X-Ray generation, radiation safety for patients and radiation safety for staff. The vascular units of instruction should include subject matter relating to noninvasive peripheral vascular studies.

The clinical units of instruction should include:

- X *Cardiac and Vascular Pathophysiology*
- X *Patient History and Physical Examination*
- X *Patient Psychology, Care and Communications*
- X *Cardiopulmonary Resuscitation*
- X *Diagnostic & Therapeutic Measures*
- X *Clinical Cardiac and Vascular Medicine*
- X *Statistics, Management of Data*
- X *Physics*
- X *Medical - Legal Ethics*

D. Resource Assessment

The program must, at least annually, assess the appropriateness and effectiveness of the resources described in these standards. The results of resource assessment must be the basis for ongoing planning and appropriate change. An action plan must be developed when deficiencies are identified in the program resources. Implementation of the action plan must be documented and results measured by ongoing resource assessment.

IV. Student and Graduate Evaluation/Assessment

A. Student Evaluation

1. Frequency and Purpose

Evaluation of students must be conducted on a recurrent basis and with sufficient frequency to provide both the students and program faculty with valid and timely indications of the students' progress toward and achievement of the competencies and learning domains stated in the curriculum.

2. Documentation

Records of student evaluations must be maintained in sufficient detail to document learning progress and achievements.

B. Outcomes Assessment

1. Outcomes Assessment

The program must periodically assess its effectiveness in achieving its stated goals and learning domains. The results of this evaluation must be reflected in the review and timely revision of the program.

Outcomes assessments include, but are not limited to: national credentialing examinations performance, programmatic retention/attrition, graduate satisfaction, employer satisfaction, job placement (positive), and programmatic summative measures. The program must meet the outcomes assessment thresholds.

Programmatic summative measures, if used, should contribute to assessing effectiveness in specific learning domains. "Positive Placement" means that the graduate is employed full or part-time in a related field; and/or continuing his/her education; and/or serving in the military.

2. Outcomes Reporting

The program must periodically submit its goal(s), learning domains, evaluation systems (including type, cut score, validity, and reliability), outcomes, its analysis of the outcomes and an appropriate action plan based on the analysis.

V. Fair Practices

A. Publications and Disclosure

1. Announcements, catalogs, publications, and advertising must accurately reflect the program offered.
2. At least the following must be made known to all applicants and students: the sponsor's institutional and programmatic accreditation status as well as the name, address and phone number of the accrediting agencies; admissions policies and practices, policies on advanced placement, transfer of credits, and credits for experiential learning; number of credits required for completion of the program; tuition/fees and other costs required to complete the program; policies and processes for withdrawal and for refunds of tuition/fees.
3. At least the following must be made known to all students: academic calendar; student grievance procedure; criteria for successful completion of each segment of the curriculum and graduation; and policies and processes by which students may perform clinical work while enrolled in the program.

B. Lawful and Non-discriminatory Practices

All activities associated with the program, including student and faculty recruitment, student admission, and faculty employment practices, must be non-discriminatory and in accord with federal and state statutes, rules, and regulations. There must be a faculty grievance procedure made known to all paid faculty.

C. Safeguards

The health and safety of patients, students, and faculty associated with the educational activities of the students must be adequately safeguarded. All activities required in the program must be educational and students must not be substituted for staff.

D. Student Records

Satisfactory records must be maintained for student admission, advisement, counseling, and evaluation. Grades and credits for courses must be recorded on the student transcript and permanently maintained by the sponsor in a safe and accessible location.

E. Substantive Change

The sponsor must report substantive change(s) as described in Appendix A to CAAHEP/JRC-CVT in a timely manner. Additional substantive changes to be reported to JRC-CVT within the time limits prescribed include:

Changes to the institution's mission or objectives if these will affect the program; the institution's legal status or form of control; the addition or deletion of courses that represent a change in content or in method of delivery; the degree or credential level; clock hours to credit hours or vice versa; an increase or decrease in clock or credit hours for successful completion of a program or in the length of a program.

F. Agreements

There must be a formal affiliation agreement or memorandum of understanding between the sponsor and all other entities that participate in the education of the students describing the relationship, role, and responsibilities between the sponsor and that entity.

APPENDIX A

Application, Maintenance and Administration of Accreditation

A. Program and Sponsor Responsibilities

1. Applying for Initial Accreditation

- a. The chief executive officer or an officially designated representative of the sponsor completes a "Request for Accreditation Services" form and returns it to:

JRC-CVT
3525 Ellicott Mills Drive
Suite N
Ellicott City, MD 21043

The "Request for Accreditation Services" form can be obtained from JRC-CVT, CAAHEP, or the CAAHEP website at www.caahep.org.

Note: There is **no** CAAHEP fee when applying for accreditation services; however, individual committees on accreditation may have an application fee.

- b. The program undergoes a comprehensive review, which includes a written self-study report and an on-site review.

The self-study instructions and report form are available from the JRC-CVT. The on-site review will be scheduled in cooperation with the program and once the self-study report has been completed, submitted, and accepted by the JRC-CVT.

2. Applying for Continuing Accreditation

- a. Upon written notice from the JRC-CVT, the Chief Executive Officer or an officially designated representative of the sponsor completes a “Request for Accreditation Services” form, and returns it to:

JRC-CVT
3525 Ellicott Mills Drive
Suite N
Ellicott City, MD 21043

- b. The program may undergo a comprehensive review in accordance with the policies and procedures of the JRC-CVT.

If it is determined that there were significant concerns with the on-site review, the sponsor may request a second site visit with a different team.

After the on-site review team submits a report of its findings, the sponsor is provided the opportunity to comment in writing and to correct factual errors prior to the JRC-CVT forwarding a recommendation to CAAHEP.

3. Administrative Requirements for Maintaining Accreditation

- a. The program must inform the JRC-CVT and CAAHEP within a reasonable period of time (as defined by the JRC-CVT and CAAHEP policies) of changes in Chief Executive Officer, Dean of Health Professions or equivalent position, and required program personnel.
- b. The sponsor must inform CAAHEP and the JRC-CVT of its intent to transfer program sponsorship. To begin the process for a Transfer of Sponsorship, the current sponsor must submit a letter (signed by the CEO or designated individual) to CAAHEP and the JRC-CVT that it is relinquishing its sponsorship of the program. Additionally, the new sponsor must submit a “Request for Transfer of Sponsorship Services” form. The JRC-CVT has the discretion of requesting a new self-study report with or without an on-site review. Applying for a transfer of sponsorship does not guarantee that the transfer of accreditation will be granted.
- c. The sponsor must promptly inform CAAHEP and the JRC-CVT of any adverse decision affecting its accreditation by recognized institutional accrediting agencies and/or state agencies (or their equivalent).

- d. Comprehensive reviews are scheduled by the JRC-CVT in accordance with its policies and procedures. The time between comprehensive reviews is determined by the JRC-CVT and based on the program's on-going compliance with the **Standards**. However, all programs must undergo a comprehensive review at least once every ten years.
- e. The program and the sponsor must pay JRC-CVT and CAAHEP fees within a reasonable period of time, as determined by the JRC-CVT and CAAHEP respectively.
- f. The sponsor must file all reports in a timely manner (self-study report, progress reports, annual reports, etc.) in accordance with JRC-CVT policy.
- g. The sponsor must agree to a reasonable on-site review date that provides sufficient time for CAAHEP to act on a JRC-CVT accreditation recommendation prior to the "next comprehensive review" period, which was designated by CAAHEP at the time of its last accreditation action, or a reasonable date otherwise designated by the JRC-CVT.

Failure to meet any of the aforementioned administrative requirements may lead to administrative probation and ultimately to the withdrawal of accreditation. CAAHEP will immediately rescind administrative probation once all administrative deficiencies have been rectified.

4. Voluntary Withdrawal of a CAAHEP-Accredited Program

Voluntary withdrawal of accreditation from CAAHEP may be requested at any time by the Chief Executive Officer or an officially designated representative of the sponsor writing to CAAHEP indicating: the last date of student enrollment, the desired effective date of the voluntary withdrawal, and the location where all records will be kept for students who have completed the program.

5. Requesting Inactive Status of a CAAHEP-Accredited Program

Inactive status may be requested from CAAHEP at any time by the Chief Executive Officer or an officially designated representative of the sponsor writing to CAAHEP indicating the desired date to become inactive. No students can be enrolled or matriculated in the program at any time during the time period in which the program is on inactive status. The maximum period for inactive status is two years. The sponsor must continue to pay all required fees to the JRC-CVT and CAAHEP to maintain its accreditation status.

To reactivate the program the Chief Executive Officer or an officially designated representative of the sponsor must notify CAAHEP of its intent to do so in writing to both CAAHEP and the JRC-CVT. The sponsor will be notified by the JRC-CVT of additional requirements, if any, that must be met to restore active status.

If the sponsor has not notified CAAHEP of its intent to re-activate a program by the end of the two-year period, CAAHEP will consider this a "Voluntary Withdrawal of Accreditation."

B. CAAHEP and Committee on Accreditation Responsibilities – Accreditation Recommendation Process

1. After a program has had the opportunity to comment in writing and to correct factual errors on the on-site review report, the JRC-CVT forwards a status of public recognition recommendation to the CAAHEP Board of Directors. The recommendation may be for any of the following statuses: initial accreditation, continuing accreditation, transfer of sponsorship, probationary accreditation, withhold accreditation, or withdraw accreditation.

The decision of the CAAHEP Board of Directors is provided in writing to the sponsor immediately following the CAAHEP meeting at which the program was reviewed and voted upon.

2. Before the JRC-CVT forwards a recommendation to CAAHEP that a program be placed on probationary accreditation, the sponsor must have the opportunity to request reconsideration of that recommendation or to request voluntary withdrawal of accreditation. The JRC-CVT reconsideration of a recommendation for probationary accreditation must be based on conditions existing both when the committee arrived at its recommendation as well as on subsequent documented evidence of corrected deficiencies provided by the sponsor.

The CAAHEP Board of Directors' decision to confer probationary accreditation is not subject to appeal.

3. Before the JRC-CVT forwards a recommendation to CAAHEP that a program's accreditation be withdrawn or that accreditation be withheld, the sponsor must have the opportunity to request reconsideration of the recommendation, or to request voluntary withdrawal of accreditation or withdrawal of the accreditation application, whichever is applicable. The JRC-CVT reconsideration of a recommendation of withdraw or withhold accreditation must be based on conditions existing both when the JRC-CVT arrived at its recommendation as well as on subsequent documented evidence of corrected deficiencies provided by the sponsor.

The CAAHEP Board of Directors' decision to withdraw or withhold accreditation may be appealed. A copy of the CAAHEP "Appeal of Adverse Accreditation Actions" is enclosed with the CAAHEP letter notifying the sponsor of either of these actions.

At the completion of due process, when accreditation is withheld or withdrawn, the sponsor's Chief Executive Officer is provided with a statement of each deficiency. Programs are eligible to re-apply for accreditation once the sponsor believes that the program is in compliance with the accreditation **Standards**.

Any student who completes a program that was accredited by CAAHEP at any time during his/her matriculation is deemed by CAAHEP to be a graduate of a CAAHEP-accredited program.