

CARDIAC TECHNOLOGIST SERIES

Code No.	Class Title	Occ. Area	Work Area	Prob. Period	Effective Date	Last Action
4084	Cardiac Technologist I	02	446	6 mo.	00/00/00	Rev.
4561	Cardiac Technologist II	02	446	6 mo.	00/00/00	Rev.
4771	Cardiac Technologist III	02	446	6 mo.	00/00/00	Rev.
4772	Cardiac Technologist IV	02	446	12 mo.	00/00/00	Rev.

Promotional Line: 243

Series Narrative

Employees in this series assist physicians in conducting cardiovascular tests on patients in a healthcare facility to help provide them with data used in the diagnosis, treatment, and prognosis of diseases of the patient's heart. The tests involve the exploration of the heart and central circulation systems by invasive or non-invasive methods and include such procedures as phonocardiography (to register heart sounds), electrocardiography (to record electrical currents released in the heart muscle), pulmonary function (to measure the lung capacity of the patient), cardiac catheterization (to measure blood pressure inside the heart), and electrophysiology (the placing of multiple electrode catheters inside the heart to record electrical signals from the various chambers of the heart).

Cardiac Technologists typically prepare the cardiac laboratories for the scheduled procedures (such as ensuring the availability of needed equipment and supplies and arranging them properly in the laboratory); operate, monitor, and maintain standard and specialized equipment used in the tests (such as phonocardiographs, electrocardiographs, cardiac output computers, magnetic tape data systems, blood gas analyzers, and television monitors); provide direct assistance to physicians during the tests (such as handing instruments and catheters to them) or when emergency resuscitation measures are needed; and record, collect, and help evaluate data from the equipment.

Higher level Technologists also assist in research studies (such as gathering, compiling, and making preliminary evaluations of data) and assist in the management of the cardiology laboratory (such as scheduling and coordinating the activities of lower level Technologists and other support staff, providing inservice training for staff members, and assisting in the fiscal management of the laboratory and in the evaluation of its procedures).

DESCRIPTIONS OF LEVELS OF WORK

Level I: Cardiac Technologist I

4084

Employees at this level provide simpler assistance to more experienced technologists and physicians during cardiac laboratory procedures. They work under direct supervision from a designated supervisor.

A Cardiac Technologist I typically –

1. prepares and positions patients for testing (such as assisting patients in assuming required position on table; draping body areas of concern with sterile towels or sheets and sterilizing these areas, using gauze and antiseptics; and fastening immobilization straps)

2. monitors patients' blood pressure and heart rate using equipment (such as polygraph, electrocardiograph, oscilloscope, television monitor, and respirator) and advises the physician of any abnormal indicators
3. either manually or with dedicated equipment, analyzes expired gases and blood specimens (such as the patient's oxygen consumption and blood gas level) and measures the patient's blood pressure in various heart chambers
4. under direct supervision from a senior technologist, learns to operate specialized equipment (such as cineangiographic cameras that take motion pictures of the passage of contrast media through blood vessels) and learns to process the film with the film processor
5. sets up noninvasive laboratories and aids the physician in administering such tests as phonocardiographies and pulmonary function testing, echocardiographic testing, and exercise testing
6. aids higher level technologists in selecting medical instruments (such as catheter needles, tubing, and guide wires to be used in catheterization)
7. assumes responsibility for compiling and recording pertinent information on patients (such as attaching films and machine readings to patient's chart; noting in cardiac logbook patient's identification, exact area pictured, exposure time, and any other technical data); labels and seals blood samples taken during procedures; obtains and records patient identification, medical history, or test results
8. as directed, aids in performing emergency resuscitation measures (such as giving oxygen to the patient)
9. remains with patient and physician throughout the procedures and removes, disassembles, cleans, and sterilizes medical equipment and materials upon completion
10. performs related duties as assigned

Level II: Cardiac Technologist II**4561**

Employees at this level are experienced technologists who provide journey-level assistance to physicians or more advanced technologists in cardiac laboratory procedures. They work under general supervision from a designated supervisor.

A Cardiac Technologist II typically –

1. consults the daily schedule, determines equipment needed and preparations to be made according to patient's prescription; prepares the laboratory for any indicated procedure (such as setting up television monitors and recording equipment); obtains tray of sterile surgical instruments; and assembles needed materials (such as dyes and injectable opaque fluids) for use by the attending physician

2. confers with patients, explaining the nature of the procedures to allay fears and anxieties association with the equipment and procedures and to elicit cooperation; monitors patients' comfort and safety during tests, alerts physicians to abnormalities or changes in patient responses
3. sets up, calibrates, operates, and collects data from specialized equipment (such as calibrating oscilloscope tracings to record arterial pressures, temperatures, and respiratory rates); observes gauges, recorder, and video screens of data analysis system during imaging of cardiovascular system
4. as directed, aids the physician throughout the cardiac testing procedure (such as handing appropriate instruments and catheters to the physician) and performs emergency resuscitation measures (such as applying a defibrillation device to heart muscles or giving oxygen to the patient)
5. monitors specialized procedures, advising the physician of any abnormal indicators (such as oxygen saturation, blood gasses and air analysis), and monitors electronic recordings (such as electrocardiograms and cardiac pressures)
6. prepares daily work reports that show the number and types of tests made and supplies used; and replenishes supply cabinets with items used in the examination or diagnostic procedure
7. checks, tests, and maintains equipment to ensure proper operation, making incidental repairs and adjustments and replacing needed parts (such as screws, lamps, and batteries); reports major repairs or replacements needed to supervisor
8. adjusts equipment and controls according to physicians' orders or established protocol
9. performs related duties as assigned

Level III: Cardiac Technologist III**4771**

Employees at this level are highly skilled technologists who provide advanced assistance to physicians in performing cardiac laboratory procedures to treat patients and/or in conducting complementary research studies. They work under direction from designated supervisors.

A Cardiac Technologist III typically –

1. operates, monitors, and maintains complex electronic equipment, such as pressure transducers, physiologic recording equipment, oxygen consumption equipment, computerized treadmills, computer analysis systems, and video equipment (for example, attaches electrodes to the patients' chests, arms, and legs, connect electrodes to leads from the electrocardiogram EKG machine, and operate the EKG machine to obtain a reading)
2. calculates and records pertinent data obtained during the studies (such as blood volume, rate of flow, blood pressure, and the exact size and severity of the cardiac defect)
3. assists in performing percutaneous transluminal coronary angioplasty (balloon dilatation of narrowed lesion of the heart)

4. administers contrast media to the patient to illuminate the chambers of the heart and of the great blood vessels
5. serves as a technical resource for the cardiology department in an assigned laboratory (such as cardiac catheterization, stress treadmill, or pulmonary function)
6. develops inservice training materials for procedures to be used in the operation and maintenance of the laboratory
7. participates in therapeutic drug control studies by interviewing subjects and reviewing and recording subjects' reactions to treatment protocol
8. recommends procurement of equipment and supplies and assumes responsibility for their inventory and utilization
9. is responsible for maintaining safe conditions in the laboratory, including orderliness and cleanliness, keeping supplies and equipment in aseptic condition, and training subordinates in the proper control of contaminants
10. performs related duties as assigned

Level IV: Cardiac Technologist IV**4772**

Employees at this level coordinate the activities of the technical and support staff of a large cardiology laboratory and assists in its management. They also provide very advanced technical assistance to physicians treating patients and conducting research studies. They work under administrative direction from a designated administrator.

A Cardiac Technologist IV typically –

1. coordinates the activities of all technical and clerical support staff in such laboratory areas as cardiac catheterization, stress treadmills, echocardiography, ambulatory telemetry, electrophysiology, and pulmonary function
2. develops, conducts, and participates in formal in-service training programs for new and complex equipment and procedures (such as the use of cardiopulmonary resuscitation equipment, phonocardiography, external pulse recordings, and blood gas analyses)
3. advises physician regarding complex diagnostic cardiac catheterization evaluations
4. develops research protocols and performs complex data analyses
5. interviews and participates in personnel actions, including hiring, transfers, promotions, and discipline; evaluates technical competence of subordinates
6. schedules weekend and evening coverage of all the laboratory areas and the cardiac intensive care facilities

7. provides technical expertise to the head of the cardiology section regarding fiscal management, including operating budgets, contractual services, and upgrading of facilities; prepares bid specifications for technical items; reviews bids; prepares statistical reports of activities and expenditures
8. evaluates and negotiates purchases, modifications, and reconstruction of equipment with vendors; inspects and calibrates existing equipment
9. works with physicians to develop safer, more efficient procedures; and researches procedures recommended by outside sources
10. makes precise evaluations of the patient's reactions and the analyses of data from monitoring equipment; takes appropriate action to control or compensate for adverse reactions (such as recognizing evidence of cardiac emergencies and initiating cardiopulmonary resuscitation)
11. is responsible for implementing and enforcing safety regulations in the cardiac laboratories
12. supervises and trains other cardiology technologists and students
13. performs related duties as assigned

MINIMUM ACCEPTABLE QUALIFICATIONS REQUIRED FOR ENTRY INTO:

Level I: Cardiac Technologist I

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CREDENTIALS TO BE VERIFIED BY PLACEMENT OFFICER

1. Any one or any combination of the following, totaling **two (2) years (24 months) or 24 semester hours**, from the categories below:
 - a) college credit in biology, chemistry, physiology, anatomy, physics, and/or closely related fields
 - b) work experience and/or on-the-job training in clinical cardiac laboratory techniques in a hospital or out-patient clinic

OR

Current certification as a Certified Cardiographic Technician (CCT) with Cardiovascular Credentialing International or Registered Vascular Technologist by the American Registry of Diagnostic Medical Sonographers (ARDMS)

KNOWLEDGE, SKILLS, AND ABILITIES (KSAs)

1. Basic knowledge of biology, chemistry, physiology, anatomy, and/or physics
2. Ability to learn to perform cardiac procedures

3. Ability to learn to prepare laboratory reports
4. Ability to learn to perform cardiopulmonary resuscitation
5. Ability to interact effectively with physicians, patients, and other health facility staff
6. Ability to speak and write English well
7. Ability to follow written and oral instructions
8. Manual dexterity

Level II: Cardiac Technologist II**4561**

CREDENTIALS TO BE VERIFIED BY PLACEMENT OFFICER

1. Any one or any combination of the following, totaling **two (2) years (24 months) or 24 semester hours**, from the categories below:
 - a) college credit in biology, chemistry, physiology, anatomy, physics, and/or closely related fields
 - b) work experience and/or on-the-job training in clinical cardiac laboratory techniques in a hospital or out-patient clinic

OR

Current certification as a Certified Cardiographic Technician (CCT) with Cardiovascular Credentialing International or Registered Vascular Technologist by the American Registry of Diagnostic Medical Sonographers (ARDMS)

2. **One (1) year (12 months)** work experience in a cardiac laboratory performing duties comparable to Cardiac Technologist I

NOTE: Possession of a Bachelor's degree in biology, microbiology, chemistry, physiology, anatomy, or closely related fields also satisfies requirement #1

KNOWLEDGE, SKILLS, AND ABILITIES (KSAs)

1. Knowledge of protocol commonly used in cardiac laboratories
2. Knowledge of functioning and maintenance of standard equipment used in a cardiac laboratory
3. Knowledge of cardiopulmonary resuscitation procedures
4. Knowledge of data gathering and reporting methods
5. Skill in operating and monitoring specialized cardiac laboratory equipment (such as computerized acquisition systems, electrocardiographs, and defibrillators)

6. Skill in preparation of daily work reports
7. Ability to discuss procedures with patients and allay their concerns
8. Ability to learn to perform new or different cardiac testing procedures
9. Ability to learn safety regulations, including sterile techniques
10. Ability to learn to maintain laboratory equipment

Level III: Cardiac Technologist III**4771**

CREDENTIALS TO BE VERIFIED BY PLACEMENT OFFICER

1. Any one or any combination of the following, totaling **two (2) years (24 months) or 24 semester hours**, from the categories below:
 - a) college credit in biology, chemistry, physiology, anatomy, physics, and/or closely related fields
 - b) work experience and/or on-the-job training in clinical cardiac laboratory techniques in a hospital or out-patient clinic

OR

Current certification as a Certified Cardiographic Technician (CCT) with Cardiovascular Credentialing International or Registered Vascular Technologist by the American Registry of Diagnostic Medical Sonographers (ARDMS)

2. **Three (3) years (36 months)** of work experience in a cardiac laboratory performing duties comparable to a Cardiac Technologist II

KNOWLEDGE, SKILLS, AND ABILITIES (KSAs)

1. Knowledge of the operation and maintenance of a wide variety of cardiac laboratory equipment, including electronic equipment (such as multichannel physiologic recorders, magnetic tape data acquisition systems, and cardiac output computers)
2. Knowledge of the significance of data gathered during tests
3. Knowledge of media used and dose rate appropriate for tests
4. Knowledge of instrumentation needed for a variety of laboratory procedures
5. Knowledge of cardiac laboratory safety regulations, including sterile techniques
6. Acquaintance with supply sources and inventory maintenance
7. Ability to accurately interpret data on graphs (such as blood volume rates of flow)

8. Ability to administer various drugs under a doctor's direction
9. Ability to assist in advanced cardiac laboratory procedures (such as implantation of intracardiac defibrillators)

Level IV: Cardiac Technologist IV**4772**

CREDENTIALS TO BE VERIFIED BY PLACEMENT OFFICER

1. Any one or any combination of the following, totaling **two (2) years (24 months) or 24 semester hours**, from the categories below:
 - a) college credit in biology, chemistry, physiology, anatomy, physics, and/or closely related fields
 - b) work experience and/or on-the-job training in clinical cardiac laboratory techniques in a hospital or out-patient clinic

OR

Current certification as a Certified Cardiographic Technician (CCT) with Cardiovascular Credentialing International or Registered Vascular Technologist by the American Registry of Diagnostic Medical Sonographers (ARDMS)
2. **Two (2) years (24 months)** of work experience in a cardiac laboratory performing duties comparable to a Cardiac Technologist III

KNOWLEDGE, SKILLS, AND ABILITIES (KSAs)

1. Extensive knowledge of protocols commonly used in cardiac laboratories
2. Knowledge of research protocols and interpretation of statistical analyses
3. Knowledge of current laws and practices regarding laboratory safety regulations
4. Skill in performing cardiopulmonary resuscitation
5. Ability to do cardiac laboratory financial and budget planning, including staffing levels and purchase of equipment and supplies
6. Ability to hire, train, and evaluate lower level technicians, technologists, and clerical support staff
7. Ability to accurately interpret data on graphs (such as blood volume rates of flow cardiac output computers)
8. Ability to administer various drugs under a doctor's direction