

GWYNEDD-MERCY COLLEGE

SCHOOL OF ALLIED HEALTH PROFESSIONS



CARDIOVASCULAR TECHNOLOGY PROGRAM

GWYNEDD MERCY COLLEGE
P. O. BOX 901
GWYNEDD VALLEY, PA 19437-0901
1-800-DIAL-GMC
WWW.GMC.EDU

CARDIOVASCULAR TECHNOLOGY PROGRAM
GWYNEDD-MERCY COLLEGE
Gwynedd Valley, PA 19437

THE PROFESSION:

As a cardiovascular technologist (CVT) you will be entering a highly specialized health care profession, trained to perform diagnostic procedures at the request of a physician, in order to document the presence and degree of cardiac (heart) disease. You can choose to specialize in either cardiac ultrasound or invasive cardiovascular technology.

Noninvasive Cardiovascular Technology

Cardiovascular ultrasonographers perform noninvasive diagnostic procedures using ultrasound. For these procedures you must have a thorough working knowledge of:

- ultrasound physics and instrumentation
- the anatomy of the heart and its disease mechanisms
- clinical signs and symptoms of acquired and congenital heart disease
- cardiovascular pharmacology
- ECG interpretation

Proficiency in mathematics is required in order to perform the various calculations required in the cardiac ultrasound study. In addition you must be capable of effectively communicating to the physician, and preparing a written summary of the study performed. Ultrasound studies can involve transporting heavy machinery to and from a patient's bedside as well as lifting and moving patients.

Invasive Cardiovascular Technology

As an **invasive cardiovascular technologist** you will be part of a team of specialists who work in a cardiac catheterization laboratory under the direction of a physician performing diagnostic as well as interventional procedures. Your duties during a cardiac catheterization procedure include, but are not limited to:

- assisting the physician
- utilizing sterile techniques as a scrub assistant
- monitoring and recording heart pressure and ECG tracings
- assisting in advanced cardiac life support procedures and cardiovascular drug therapy

You also need to be proficient in:

- ECG interpretation
- radiation safety and protection
- knowledge of coronary anatomy
- physiology and disease mechanisms
- cardiovascular pharmacology

And you will be required to stand during procedures wearing lead fluoroscopy aprons which weigh approximately 15 pounds.

A genuine respect for life and human dignity, good patient rapport and empathy, an aptitude for math and science, taking responsibility for your own actions and self-direction, a motivation to learn, a joy in working with others, an ability to receive constructive criticism and take verbal direction, a willingness to be on call or to do overtime if the occasion arises, an ability to concentrate for long periods of time, are all important traits for a CVT.

Technical Standards for the CVT Practitioner General:

- The ability to move equipment and/or furniture in excess of 400 pounds.
- The ability to lift, transfer, and move patients to and from wheelchair, table, stretcher and/or bed.
- The ability to stand for long periods of time.
- The ability to work well under pressure.
- The ability to work independently as well as part of a team.
- The ability to move quickly for fast paced tests and/or in emergent situations.
- The ability to use elevators and/or steps.
- The ability to wear a 15 to 20 pound lead suit.
- The ability to work in a sterile environment.

Physical Standards

- **Sitting:** Done up to 50% of the time.
- **Standing:** Done up to 50% of the time.
- **Walking:** Done frequently.
- **Climbing:** Done infrequently.
- **Pushing:** Done very frequently (over 50%). Must be able to exert energy against equipment (some with wheels), patient, and furniture over 400 pounds.
- **Stooping:** Must be able to move with agility.
- **Sensing/feeling:** Ability to detect and feel objects such as temperature, texture, tension by tactile means is done frequently.
- **Seeing:** Color and depth perception and ability to work in the dark.

- **Hearing:** Ability to hear and differentiate between sounds such as pumps for life support, telephone ringing, monitors, voices, Doppler ultrasound, beepers, overhead paging, blood pressure sounds, etc.
- **Temperature:** Ability to adapt to cold and hot environment in clinical settings.

Cognitive:

Attention/Concentration: The position requires strong concentration skills. The individual must have the ability to voluntarily sustain concentration to a task over an extended period of time as a result of an effortless and usually deliberate heightened and focused state of attention. The person must also be able to assimilate information and be able to report this information to the appropriate physician, nurse, and other health care personnel when required.

Temperaments:

- **Leadership:** Ability to accept responsibility for leadership, direction, control, planning, negotiating, organization, supervising and making decisions.
- **Creativity, Feelings, or Ideas:** Ability to perform under stress when confronted with emergency, critical, unusual, or dangerous situation, or in situations in which working speed and sustained attention are critical aspects of the job.
- **Communication:** Ability to exchange information with others clearly and concisely to present ideas, facts, technical information, and potential diagnoses to the appropriate health care personnel.
- **Work Style:** Ability to work independently as well as part of a team is necessary in the non-invasive clinical setting.

Learning Outcomes:

Flowing from our mission and core values, the Cardiovascular Technology Program has established the following learning outcomes for the students enrolled in the programs. Students will be expected to develop the following competencies:

- Communication Skills
- Professional Competency
- Moral and Ethical Judgment
- Problem Solving
- Critical Thinking
- Leadership in Society
- Critical and Competent Use of Technology

Students will be evaluated with respect to development of these competencies throughout the curriculum.

DESCRIPTION OF THE PROGRAM:

ASSOCIATE OF SCIENCE DEGREE PROGRAM (24 MONTHS)

The Cardiovascular Technology (CVT) program prepares you for entry-level positions in the fields of cardiovascular diagnostic medicine. The Associate of Science degree curriculum is a 24-month program of professional studies integrated with the liberal arts.

The first year you will study liberal arts and sciences along with basic theories, principles and applied techniques. The last four weeks are spent at a hospital performing ECG testing and observing procedures in cardiac ultrasound and cardiac catheterization laboratories. At the end of this year you will select your area of specialization, cardiac ultrasound or invasive cardiovascular technology.

A minimum GPA of 2.0 and current certification in Basic Cardiac Life Support are required to enter the second year of the program.

The second year is divided between campus classroom, laboratory studies, and the hospital laboratory. There are two major clinical rotations for each track. The initial, seventeen (17)-week clinical rotation is performed during the Spring semester, and the final clinical specialization experience is conducted in the summer during the last nine (9) weeks of the program.

Diplomas, certificates of specialization, and College pins are conferred during the August closing ceremony.

Successful completion of the second year of the program qualifies you to sit for the appropriate registry examination. Professional registry in Invasive Cardiovascular Technology is sponsored by Cardiovascular Credentialing International (CCI). Cardiac Ultrasonographers may choose to become registered through Cardiovascular Credentialing International (CCI) or the Association of Registered Diagnostic Medical Sonographers (ARDMS).

CERTIFICATE PROGRAM (12 MONTHS, full time)

With previous experience, and prerequisite sciences, you may apply for admission into either the cardiac ultrasound track or the invasive cardiovascular track. Certificate candidates must be competent in ECG interpretation.

APPLICATION PROCEDURE

Early application is encouraged. Enrollment in the track programs is limited. Selection will be made on the student's total GPA, and experience. The Associate Degree students will be granted priority placement.

Applicants for the Associate of Science Degree are required to:

- 1) Complete your College application form and submit official transcripts from all schools previously attended, including high school. All transcripts must be sent to the Director of Admissions.
- 2) Submit 2 letters of recommendation. It is preferred that one letter be from a former teacher, and one from a former employer. Letters of recommendation are sent to the Director of Admissions.
- 3) Set up an appointment with the CVT program director for an interview.
- 4) You are required to visit a cardiac catheterization laboratory and a noninvasive cardiovascular laboratory and submit the complete "Shadow" Experience" forms to the CVT Program Director's office.

Additional requirements:

- 1) You must have achieved a minimum grade of "C+" in High School level Chemistry and Algebra, or their equivalent. There is a 5-year limitation on any college-level science and math courses.
- 2) You must successfully complete the Mathematics Proficiency examination administered by the college. Candidates who are deficient in this area must illustrate competency in basic high school mathematics before matriculating into the CVT program.
- 3) SAT scores---a minimum Math score of 450 is required.
- 4) If you are a transfer student you must have a minimum 2.0 GPA.

Applicants for the Certificate program are required to:

- 1) Complete steps 1-2 above.
- 2) Submit proof of current BCLS, Course C, and certification.
- 3) Achieve a score of 75% or better on the ECG proficiency examination. Individuals who do not wish to take the ECG proficiency examination will be required to take CV 130, Principles of Electrocardiography.
- 4) Set up an appointment with the CVT program director for an interview.

- 5) Visit either a cardiac catheterization laboratory or a noninvasive cardiovascular laboratory and submit the completed "Shadow Experience" form to the CVT Program Director's office.

EXPENSES

For details on tuition, fees and institutional expenses, please refer to the College Catalogue or the College's website at www.gmc.edu.

All students enrolled in Allied Health Programs are required to carry **Professional Liability Insurance**. This policy is arranged by the business office of the College. Before entering the clinical setting, you must submit to the Program Director, **proof of personal health care insurance**. The College does provide a health care coverage plan for those who do not have such insurance.

Uniforms are required for the clinical experiences. You are also responsible for your own transportation to and from the clinical sites. All meals and parking fees, while at the clinical site, are your responsibility.

Students are required to submit a certified background check and drug testing results prior to beginning clinical rotations. The fee is approximately \$75.00.

CARDIOVASCULAR TECHNOLOGY PROGRAM
GWYNEDD-MERCY COLLEGE
Gwynedd Valley, Pa 19437

Shadow Experience for Invasive Cardiovascular Laboratory

The purpose of this shadow experience is to enable potential applicants of Gwynedd-Mercy's Cardiovascular Technology Program to gain a broad understanding of the routine activities in an Invasive Cardiovascular Laboratory (Cardiac Catheterization Laboratory), as well as the typical duties of an Invasive Technologist. The "shadow" supervisor should verify on the checklist which items the applicant did witness. It is not absolutely necessary that every item on the checklist be observed. We understand that the applicant may only spend a few hours observing, but it is expected that they leave with a general understanding of the duties of a CVT.

Thank you for your cooperation.

Applicant's Name _____
Date of Visit _____ Arrival Time _____ Depart _____
Hospital _____
Name of Shadow Supervisor _____

Invasive (Cardiac Catheterization) Laboratory Site Checklist:

- Witnessed a "surgical scrub" (handwash)
- Witnessed technologist setting up the lab for next procedure
- Witnessed technologist preparing patient for the procedure
- Witnessed technologist performing hemodynamic monitoring (watching and recording heart pressure and ECG tracings) during a procedure
- Witnessed the gowned/scrubbed technologist assisting the physician during the procedure
- Witnessed the physician performing the procedure
- Witnessed the technologist(s) performing miscellaneous duties during the procedure such as obtaining new equipment
- Saw the "X-Ray in Use" signs
- Saw a catheter up close
- Saw the film development room
- Witnessed medications being administered to the patient
- Witnessed emergency procedures being performed
- Witnessed the technologist with a patient in the Cath Lab Holding/Recovery Area

Signature of Supervisor _____

CARDIOVASCULAR TECHNOLOGY PROGRAM
GWYNEDD-MERCY COLLEGE
Gwynedd Valley, PA 19437

Shadow Experience for Noninvasive Cardiovascular Laboratory

The purpose of this shadow experience is to enable potential applicants to Gwynedd-Mercy's Cardiovascular Technology Program to gain a broad understanding of the routine activities in a Noninvasive Cardiovascular Laboratory (Cardiac Ultrasound specifically), as well as the typical duties of a Noninvasive Technologist. The "shadow" supervisor should verify on this checklist which items the applicant did witness. It is not absolutely necessary that every item on the checklist be observed. We understand that the applicant may only spend a few hours observing, but it is expected that they leave with a general understanding of the duties of a CVT.

Thank you for your cooperation.

Applicant's Name _____
Date of Visit _____ Arrival Time _____ Depart _____
Hospital _____
Name of Shadow Supervisor _____

Noninvasive (Cardiac Ultrasound) Laboratory Site Checklist:

- Witnessed a 12 lead ECG being performed
- Saw the Stress Test Room: ECG Monitor, Tread Mill
- Witnessed the technologist preparing a patient for an Exercise Stress Test
- Witnessed the technologist monitoring a patient (ECG, heart rate, blood pressure, symptoms) during an Exercise Stress Test
- Witnessed the technologist placing Holter Monitor on a patient
- Witnessed the technologist "scanning" part of a Holter Monitor ECG Tracing
- Witnessed an Echocardiogram (Cardiac Ultrasound Study) being performed in the department
- Witnessed a Color Flow Mapping and Doppler Echocardiogram being performed
- Witnessed the technologist performing measurements and calculations on an Echocardiogram
- Witnessed the technologist preparing the preliminary report of an Echocardiogram for the physician to read
- Witnessed a Transesophageal Echocardiogram
- Witnessed emergency procedures being performed
- Witnessed a treadmill stress echo
- Witnessed a dobutamine stress echo

Signature of Supervisor _____



A student must complete the course and credit requirements as defined on this curriculum sheet to be a candidate for the Associate of Science in Cardiovascular Technology. Additional policies and procedures may be found in the current **College Catalog**. Refer to the reverse side for recommended semester sequence.

**GMC: Growing Mercy Connections
GENERAL EDUCATION AND CORE CURRICULUM**

I. Skills for Exploring – 6 credits

FYE 1000	First Year Experience	2		
FYE 1001	First Year Experience Service	1		
ENG 101	College English	3		

II. Exploring Society and Global Diversity – 3 credits

PSY 100	General Psychology	3		
---------	--------------------	---	--	--

**III. Exploring the Natural World, Mathematics
and Technology – 21 credits**

BIO 107	Anatomy & Physiology I	3		
BIO 107L	Anatomy & Physiology I Lab	1		
BIO 108	Anatomy & Physiology II	3		
BIO 108L	Anatomy & Physiology II Lab	1		
BIO 111	Microbiology	3		
BIO 111L	Microbiology Lab	1		
CHM 111	Chemistry for Allied Health	3		
MTH 136	Topics of Math	3		
PHY 111	Physics for Allied Health	3		

IV. Exploring the Spiritual World – 6 credits

PHL 2000	Encountering Ethics	3		
RS 2000	Encountering Sacred Writings	3		

V. Exploring the Arts and Imagination – 3 credits

ENG 2001	Arts and Ideas	3		
----------	----------------	---	--	--

MAJOR

Cardiovascular Technology – 14 credits

CV 110	CV Clinical Laboratory Skills I	1		
CV 120	Cardiovascular Anatomy and Physiology	3		
CV 130	Principles of Electrdiography	3		
CV 130L	Principles of Electrocardiography Lab	1		
CV 135	Cardiovascular Pharmacology	3		
CV 140	Cardiovascular Clinical Skills II	1		
CV 200	Cardiac Pathophysiology	2		

Track Option - 17 credits

Ultrasound Track:

CV 220	Physical Principles of Ultrasound	1		
CV 222	Foundations of Cardiac Ultrasound Practice	3		
CV 222L	Foundations of Cardiac Ultrasound Lab	1		
CV 226	Cardiac Ultrasound Clinical Special I 480 clinical contact hours	3		
CV 228	Cardiac Ultrasound Clinical Symposium I	3		
CV 252	Cardiac Ultrasound Clinical Special II 400 clinical contact hours	4		
CV 254	Cardiac Ultrasound Clinical Symposium II	2		

Invasive Track:

CV 230	Physical Principles Invasive CVT	1		
CV 232	Foundations of Invasive CVT Practice	3		
CV 232L	Foundations Invasive CVT Lab	1		
CV 236	Invasive Cardiovascular Clinical Special I – 480 clinical contact hours	3		
CV 238	Invasive Cardiovascular Clinical Symposium I	3		
CV 262	Invasive Cardiovascular Clinical Special II - - -400 clinical contact hours	4		
CV 264	Invasive Cardiovascular Clinical Symposium II	2		

Credit Requirement

A minimum of 70 credits is required for this degree.

Grade Requirements

The minimum passing grade within the natural science/mathematics and the concentration is C (a grade of C- is not acceptable).