Cardiovascular Technologist and Technician

Professional Activities

Cardiovascular technologists and technicians assist physicians in diagnosing and treating cardiac (heart) and peripheral vascular (blood vessel) ailments. They may specialize in three areas of practice: invasive cardiology, echocardiography, and vascular technology. Cardiovascular technicians who specialize in electrocardiograms (EKGs), stress testing, and Holter monitors are known as cardiographic or EKG technicians.

Cardiovascular technologists specializing in invasive procedures are called cardiology technologists. They assist physicians with cardiac catheterization procedures in which a small tube, or catheter, is wound through a patient's blood vessel from a spot on the patient's leg into the heart. The procedure can determine if a blockage exists in the blood vessels that supply the heart muscle and help diagnose other problems. Part of the procedure may involve balloon angioplasty, which can be used to treat blockages of blood vessels or heart valves, without the need for heart surgery. Cardiology technologists assist physicians as they insert a catheter with a balloon on the end to the point of the obstruction.

Technologists prepare patients for cardiac catheterization and balloon angioplasty by first positioning them on an examining table and then shaving, cleaning, and administering anesthesia to the top of the patient's leg near the groin. During the procedures, they monitor patients' blood pressure and heart rate using EKG equipment and notify the physician if something appears wrong. Technologists also may prepare and monitor patients during open-heart surgery and the implantation of pacemakers.

Cardiovascular technologists who specialize in echocardiography or vascular technology often run noninvasive tests using ultrasound instrumentation, such as doppler ultrasound. Tests are called "noninvasive" if they do not require the insertion of probes or other instruments into the patient's body. While performing the scan, technologists check the image on the screen for subtle differences between healthy and diseased areas, decide which images to include, and judge if the images are satisfactory for diagnostic purposes. They also explain the procedure to patients, record additional medical history, select appropriate equipment settings, and change the patient's position as necessary. (See the description of diagnostic medical sonographers in LifeWork's alphabetical list of careers.)

Those who assist physicians in the diagnosis of disorders affecting circulation are known as vascular technologists or vascular sonographers. They perform a medical history and evaluate pulses by listening to the sounds of the arteries for abnormalities. Then they perform a noninvasive procedure using ultrasound instrumentation to record vascular information, such as vascular blood flow, blood pressure, limb volume changes, oxygen saturation, cerebral circulation, peripheral circulation, and abdominal circulation.

Technologists who use ultrasound to examine the heart chambers, valves, and vessels are referred to as cardiac sonographers, echocardiographers. They use ultrasound instrumentation to create images called echocardiograms. This may be done while the patient is either resting or physically active. Technologists may administer medication to a physically active patient to assess their heart function. Cardiac sonographers may also assist physicians who perform transesophageal echocardiography, which involves placing a tube in the patient's esophagus to obtain ultrasound images.

Cardiovascular technicians who obtain EKGs are known as electrocardiograph (or EKG) technicians. To take a basic EKG, which traces electrical impulses transmitted by the heart, technicians attach electrodes to the

patient's chest, arms, and legs, and then manipulate switches on an EKG machine to obtain a reading. A printout is made for interpretation by the physician. This test is done before most kinds of surgery and as part of a routine physical examination, especially for persons who have reached middle-age or have a history of cardiovascular problems. Some cardiovascular technologists and technicians schedule appointments, type doctor interpretations, maintain patient files, and care for equipment.

EKG technicians with advanced training perform Holter monitor and stress testing. For Holter monitoring, technicians place electrodes on the patient's chest and attach a portable EKG monitor to the patient's belt. Following 24 or more hours of normal activity by the patient, the technician removes a tape from the monitor and places it in a scanner. After checking the quality of the recorded impulses on an electronic screen, the technician usually prints the information from the tape so that a physician can interpret it later. Physicians use the output from the scanner to diagnose heart ailments, such as heart rhythm abnormalities or problems with pacemakers.

For a treadmill stress test, EKG technicians document the patient's medical history, explain the procedure, connect the patient to an EKG monitor, and obtain a baseline reading and resting blood pressure. Next, they monitor the heart's performance while the patient is walking on a treadmill, gradually increasing the treadmill's speed to observe the effect of increased exertion. Like vascular technologists and cardiac sonographers, cardiographic technicians who perform EKG, Holter monitor, and stress tests are known as "noninvasive" technicians.

Technologists and technicians generally work a 5-day, 40-hour week that may include weekends. Those in catheterization labs tend to work longer hours and may work evenings. They also may be on call during the night and on weekends. Cardiovascular technologists and technicians must be accurate and thorough. They spend a lot of time walking and standing indoors. Those who work in catheterization labs may face stressful working conditions, because they are in close contact with patients with serious heart ailments. Some patients, for example, may encounter complications from time to time that have life or death implications.

Educational Requirements

Although a few cardiovascular technologists, vascular technologists, and cardiac sonographers are currently trained on the job, most receive training in 2- to 4-year programs. Cardiovascular technologists, vascular technologists, and cardiac sonographers normally complete a 2-year junior or community college program. The first year is dedicated to core courses followed by a year of specialized instruction in either invasive, noninvasive cardiovascular, or noninvasive vascular technology. Those who are qualified in a related allied health profession only need to complete the year of specialized instruction.

Most EKG technicians are trained on the job by an EKG supervisor or a cardiologist. On-the-job training usually lasts about 8 to 16 weeks. Most employers prefer to train people already in the health care field—nursing aides, for example. Some EKG technicians are students enrolled in 2-year programs to become technologists, working part time to gain experience and make contact with employers. One-year certification programs exist for basic EKGs, Holter monitoring, and stress testing.

Academic Programs

Harper College
Midwestern Career College
Sanford-Brown College

Employment/Salary Outlook

As imaging technology evolves, medical facilities will use it to replace more invasive, costly procedures. Technological advances and less expensive equipment now allow more procedures to be done outside of hospitals. Third-party payers encourage the use of these noninvasive measures over invasive ones. Although hospitals remain the primary employer of cardiovascular technologists and technicians and vascular technologists, employment is expected to grow more rapidly in physicians' offices and in medical and diagnostic laboratories. Employment in these healthcare settings is expected to increase because of a shift toward outpatient care whenever possible.

As the large baby-boom population ages and people remain active later in life, the need to diagnose medical conditions—such as blood clots and tumors—with imaging technology will likely increase. Cardiovascular technologists and technicians and vascular technologists will continue to be needed to use and maintain the equipment needed for diagnosis and treatment.

State and National Wages

Location	Pay Period	2021		
		Low	Median	High
United States	Hourly	$14.38	$29.12	$47.15
	Annual	$29,910	$60,570	$98,070
Illinois	Hourly	$14.35	$22.67	$46.17
	Annual	$29,840	$47,150	$96,040

State and National Trends

United States	Employment		Percent Change	Job Openings [1]
	2020	2030		
Cardiovascular Technologists and Technicians	58,200	63,000	8%	4,700
Illinois	**Employment**		**Percent Change**	**Job Openings [1]**
	2018	**2028**		
Cardiovascular Technologists and Technicians	2,590	2,570	-1%	140

[1]Job Openings refers to the average annual job openings due to growth and net replacement.

Professional Organizations

Cardiovascular Credentialing International (cci-online.org)
American Society of Echocardiography (asecho.org)

References

Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics (http://www.bls.gov/ooh/healthcare/cardiovasuclar technologist)

O*NET OnLine (http://online.onetcenter.org/link/summary/29-2031.00)

Last Modified: August 16, 2022