Area of Interest: Health Sciences

Diagnostic Cardiac Sonography

Ontario College Graduate Certificate Program Code: 1693X01FWO

2 Years

Ottawa Campus

Our Program

Further your career in cardiac sonography, exploring theory and clinical practice.

The two-year Diagnostic Cardiac Sonography Ontario College Graduate Certificate provides you with the essential theoretical knowledge and technical skills required to produce, evaluate and diagnose sonographic images of the heart.

Through theory, simulation, lab practice and extensive clinical experiences, you learn to manipulate sound waves to create images of the human heart. You consider health and safety in your work and apply quality assurance for the safe and proper use of ultrasound in the clinical setting.

This program offers you the hands-on skills you need for success. You have two, 450-hour field placements where you enhance your technical, professional, interpersonal and patient management skills. These acquired skills help you to function as a member of a healthcare team.

As a graduate you are eligible to write the national certification exams. Algonquin College`s Diagnostic Cardiac Sonography program received accreditation from Accreditation Canada EQUAL in September 2019.

Upon successful completion of the program, to become credentialed as a Cardiac Sonographer in Ontario a student must write the Sonography certification examination. Graduates must also register with the College of Medical Radiation and Imaging Technologists of Ontario (CMRITO) to be eligible to work in Ontario. Graduates may also register with ARDMS(American Registered Diagnostic Medical Sonography).

You may find employment as a:

- cardiac sonographer
- sonography educator
- medical technical salesperson
- application specialist
- medical researcher
- manager or supervisor in related fields

SUCCESS FACTORS

This program is well suited for students who:

- Possess excellent communication and interpersonal skills.
- Are self-directed in a team environment.
- Demonstrate proficiency with technology.
- Possess good hand-eye coordination and are detail-oriented.
- Hold strong analytical and perceptual skills.

- Desire to work in a variety of challenging employment settings.
- Are able to work effectively under stressful situations.
- Are detail-oriented and conscientious.
- Possess the ability to think critically and to self-reflect.

Employment

Graduates may find employment as cardiac sonographers, sonography educators, medical technical salespeople, application specialists and medical researchers, as well as managers or supervisors in related fields. Upon successful completion of the program, to become credentialed, a student must write the Sonography Canada certification examination.Graduates must also register with the College of Medical Radiation and Imaging Technologists of Ontario (CMRITO) to be eligible to work in Ontario.

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Act in accordance with applicable regulations and professional guidelines to meet the standards of practice.
- Perform examination procedures, obtain images, correlate results, and analyze data using critical thinking and problem solving to meet diagnostic expectations of the health care team.
- Provide care that recognizes and respects the dignity, culture and individuality of patients and clients to ensure a safe and comfortable environment.
- Perform as an effective practitioner within cardiac sonography to be a valuable member of the multi-disciplinary health care team, assuming a leadership role as required.
- Communicate effectively and professionally as a member of a multi-disciplinary healthcare team using relevant terminology, behaviour and language appropriate to the recipient to ensure understanding and informed care.
- Operate ultrasound equipment safely and effectively to ensure patient/workplace safety.
- Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.

Program of Study

Level: 01	Courses	Hours
IMG1002	Sonography Physics and Instrumentation I	42.0
IMG1023	Introduction to Echocardiography	56.0
IMG1024	Cardiac Scanning Lab I	84.0
IMG1025	Applied Cardiovascular Physiology	42.0
IMG1035	Professional Practice and Legislation for Medical Imaging Professionals	28.0
IMG1043	Practice Foundations for Sonography I	14.0
Level: 02	**Courses**	**Hours**
IMG1007	Sonography Physics and Instrumentation II	42.0
IMG1026	Pathology and Function of the Adult Heart	42.0

IMG1027	Congenital Heart Disease	56.0
IMG1028	Valvular Disease	42.0
IMG1029	Cardiac Scanning Lab II	84.0
IMG1038	Patient Management for Medical Imaging Professionals	14.0
IMG1039	Patient Management Skills for Medical Imaging Professionals	14.0
IMG1044	Practice Foundations for Sonography II	14.0
Level: 03	**Courses**	**Hours**
IMG1030	Clinical Practical I	450.0
Level: 04	**Courses**	**Hours**
IMG1031	Clinical Practicum II	450.0

Fees for the 2023/2024 Academic Year

Tuition and related ancillary fees for this program can be viewed by using the Tuition and Fees Estimator tool at https://www.algonquincollege.com/fee-estimator .

Further information on fees can be found by visiting the Registrar`s Office website at https://www.algonquincollege.com/ro .

Fees are subject to change.

Additional program related expenses include:

- Clinical Practicums require training in Health and Safety, WHMIS, OWHSA training and approved Non-Violent Crisis Intervention (NVCI) training. There are some additional costs associated with training that should be anticipated by students, which are not covered by tuition fees.

- Please note that parking, travel and accommodations for all clinical activities are the responsibility of the students.

Admission Requirements for the 2024/2025 Academic Year

Program Eligibility

- Diploma, Advanced Diploma, Graduate Certificate or Degree in Medical or Health related field with a minimum of 2 courses (or equivalent) in Human/Gross Anatomy and Human Physiology, plus 1 course in Human Pathology and 3 additional human health related courses. All courses must have a minimum grade of 70% (B-) or higher.

- Examples of degrees included but not limited to: BSc Kinesiology, BA Kinesiology, BSc Nursing, Bachelor of Medical Radiation Sciences, Bachelor of Applied Health Sciences, MSc OT, MSc PT.

- Examples of Diplomas and Advanced Diplomas include, but not limited to: Medical Radiation Technology, Respiratory Therapy, Registered Practical Nursing, Cardiovascular Technology, Registered Massage Therapy, Occupational Therapy Assistant, Physiotherapy Assistant.

- All applicants must complete an assessment of their knowledge and skills through the Test Centre, and pay an exam fee. Results from the Algonquin College Health Program Admissions Test (AC-HPAT) will be utilized to establish minimum eligibility and applicant ranking. The AC-HPAT can only be written once per academic cycle. For further information on the HPAT and how to book your assessment, please visit Algonquin`s Test Centre.

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- IELTS-International English Language Testing Service (Academic) Overall band of 6.5 with a minimum of 6.0 in each band; OR TOEFL-Internet-based (iBT)-overall 88, with a minimum in each component: Reading 22; Listening 22; Speaking 22; Writing 22; OR Duolingo English Test (DET) Overall 120, minimum of 120 in Literacy and no score below 105.

Accepted Applicants:
Provide evidence of a current Cardio-Pulmonary Resuscitation Training C.P.R. Basic Life Support (BLS) certification and Standard First Aid certification.

Submit a Health Assessment Form and provide an Immunization Certificate prior to entry to the program. Applicants must have complete immunization including Hepatitis B, and annual T.B. test (a Chest X-ray is required if the T.B. test is positive) and are required to have annual immunization for influenza by some clinical affiliates.

Students in the program will be mask fit-tested for N-95 equivalent masks for infection-control measures as required by the Ministry of and Long-Term Care Guidelines.

Police Records Check Documentation:
Though not an admission requirement, applicants must note important information listed below regarding Police Record Check program requirements.

Successful completion of clinical placement is a requirement for graduation from the Diagnostic Cardiac Sonography program. Agencies that provide placement require you to have a clear Police Records Check for Service with the Vulnerable Sector (PRCSVS). Your acceptance for placement is at the discretion of the agency. If you register in the program without a clear PRCSVS and as a result are unable to participate in placement, you will not be able to graduate.

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Application Information

DIAGNOSTIC CARDIAC SONOGRAPHY
Program Code 1693X01FWO

Applications to full-time day programs must be submitted with official transcripts showing completion of the academic admission requirements through:

ontariocolleges.ca
60 Corporate Court
Guelph, Ontario N1G 5J3
1-888-892-2228

Applications are available online at http://www.ontariocolleges.ca/ .

Applications for Fall Term and Winter Term admission received by February 1 will be given equal consideration. Applications received after February 1 will be processed on a first-come, first-served basis as long as places are available.

International applicants applying from out-of-country can obtain the International Student Application Form at https://algonquincollege.force.com/myACint/ or by contacting the Registrar`s Office.

For further information on the admissions process, contact:

Registrar`s Office
Algonquin College
1385 Woodroffe Ave
Ottawa, ON K2G 1V8
Telephone: 613-727-0002
Toll-free: 1-800-565-4723
TTY: 613-727-7766
Fax: 613-727-7632
Contact: https://www.algonquincollege.com/ro

Additional Information

The Diagnostic Cardiac Sonography program is Accredited by Accreditation Canada EQUAL .

If at any time during the program there is a break in the student`s progress of one term or more, the student is required to enroll and pass a mandatory Continuing Education course to update practicum skills. The student is responsible for the cost of the required Continuing Education course and must advise the Program Coordinator of their intensions to return to the program six weeks in advance of the start of the semester in which they would like to return. Returning status will be granted based on the availability of placement sites.

During clinical practicum placement, if there are significant professional/safety infractions, students will be removed from clinical site and pending the results of the investigation may receive an F grade for the clinical placement course.

Successful completion of clinical placement is a requirement for graduation from the Diagnostic Cardiac Sonography program. Clinical placement is completed, over two 12-week terms. Placement start times are from May - August and September - November.

Every effort is made to accommodate student preferences for placements; however, due to the restricted amount of placements in this highly specialized field, students may be required to complete their placements in other areas across Ottawa or Ontario, and may not have the option to select when their placements begin.

All related clinical expenses, such as travel, parking and accommodation for these experiences are the responsibility of the student.

Very specific requests for placements inside or outside the Ottawa catchment area will be reviewed on an individual basis. Students may incur additional costs due to local administrative and legislative differences specific to those hospital services.

Prospective students are required to participate in both patient and sonographer roles in the clinical setting and in invasive procedures specifically IV insertions.

The laboratory section of the Diagnostic Cardiac Sonography curriculum teaches prospective students how to scan with their right hand only, eventhough when entering clinical placement rotations some sites may require left handed scanning.Algonquin College students will enter clinical placement proficient with their right hand.

The Canadian Medical Radiation and Imaging Technologists of Ontario has a number of requirements for registration that relate to past and present conduct of the applicant. Please follow the link for further details: https://www.cmrito.org/applicants/registration-requirements/ .

Contact Information

Program Coordinator(s)

- Rose Marie Di Bucchianico, mailto:dibuccr@algonquincollege.com ,

Course Descriptions

IMG1002 Sonography Physics and Instrumentation I

A thorough understanding of the foundational scientific theory relating to ultrasound is required for successful use of sonographic technology and instruments. Learners investigate the physical principles of ultrasound through basic theories related to the physics of ultrasound, such as properties of sound waves, transducer beam formation, artifacts, pulse echo instrumentation and real time systems. Concentration focuses on transducer construction and function, as well as parameter manipulation for image optimization.

Prerequisite(s): none
Corerequisite(s):none

IMG1007 Sonography Physics and Instrumentation II

Ultrasound equipment is highly technical and requires intricate knowledge of physics and instrumentation to operate safely and effectively. Learners explore advanced physical principles and instrumentation including Doppler physics. By way of demonstration, research and class discussion, learners recognize and analyze usage of physical principles and instrumentation used in the production of high-quality images.

Prerequisite(s): IMG1002
Corerequisite(s):none

IMG1023 Introduction to Echocardiography

Cardiac Sonographers must have thorough knowledge of the cross-sectional anatomy of the heart to achieve accurate sonographic images. Learners acquire images from different windows of the heart in long and short axes following standard echocardiogram protocol. Images and components of an echocardiogram are measured and interpreted, which can result in recommending advanced echocardiography procedures.

Prerequisite(s): none
Corerequisite(s):IMG1024

IMG1024 Cardiac Scanning Lab I

It is essential that sonographers are competent at utilizing sonographic equipment. Under direct supervision and assistance of the instructor, learners gain practical skills introduced in didactic lessons and apply these skills to achieve imaging of the heart. Learners are introduced in a simulated clinical environment to best practice methods for interacting with patients.

Prerequisite(s): none
Corerequisite(s):IMG1023

IMG1025 Applied Cardiovascular Physiology

Cardiac Sonographers evaluate the anatomy and physiology of the cardiovascular system at a variety of levels. Learners develop the ability to differentiate heart movement (slow, normal, regular, irregular or hyper-dynamic) through the ultrasound machine setup and optimal image resolution resulting in an enhanced assessment.

Prerequisite(s): none
Corerequisite(s):IMG1023

IMG1026 Pathology and Function of the Adult Heart

Understanding pathophysiology and etiology of normal and abnormal cardiac function and pathology in the adult heart is essential for the Cardiac Sonographer. Learners differentiate the sonographic diagnostic criteria used to characterize these disease states and to evaluate whether modifications to the scope of the examination are required.

Prerequisite(s): none
Corerequisite(s):none

IMG1027 Congenital Heart Disease

Cardiac Sonographers analyze normal and abnormal cardiac embryology, fetal circulation and the segmental approach to scanning congenital heart disease. Learners relate both common and complex congenital heart defects and their medical and surgical management.

Prerequisite(s): none
Corerequisite(s):none

IMG1028 Valvular Disease

Understanding pathophysiology, etiology and sonographic appearances of the disease states of heart valves is essential to the practice of Cardiac Sonography. Learners apply sonographic diagnostic criteria to characterize diseases states which, if applicable, are used to modify the scope of the examination and determine possible treatment options.

Prerequisite(s): none
Corerequisite(s):none

IMG1029 Cardiac Scanning Lab II

Essential skills are necessary before entering a clinical site to practice sonography. By scanning the heart with direct and indirect supervision, learners expand upon existing skills. With the focus on

cardiac anatomy, pathology and physical instrumentation, learners continue the practical experience of cardiac scanning with the addition of applied colour flow and pulsed continuous wave and tissue Doppler techniques. These modalities assess cardiac function and hemodynamics.

Prerequisite(s): IMG1023 and IMG1024
Corerequisite(s):none

IMG1030 Clinical Practical I

It is necessary for sonographers to be proficient at performing sonography in the clinical environment. Learners integrate applied didactic knowledge and skill to the clinical environment and perform complete ultrasound examinations under the direct and indirect supervision of the clinical educator. Through practice, discussion and mentoring, learners gain proficiency in the role of a diagnostic cardiac sonographer.

Prerequisite(s): IMG1002 (1) and IMG1023 (1) and IMG1024 (1) and IMG1025 (1) and IMG1027 (1) and IMG1028 (1) and IMG1029 (1) and IMG1043 (1)
Corerequisite(s):none

IMG1031 Clinical Practicum II

Cardiac Sonographers in the clinical setting are experts in their field and work in a competent and professional manner. Learners refine their practical, technical, professional, interpersonal and patient management skills to function as a member of the healthcare team. Learners fulfill diagnostic cardiac sonography requirements consistent with Sonography Canada Clinical Skills Assessment Manual.

Prerequisite(s): IMG1030 (1)
Corerequisite(s):none

IMG1035 Professional Practice and Legislation for Medical Imaging Professionals

Legislation and regulations govern the practice of the medical radiation technologist. Students gain an understanding of the roles of professional associations, codes of ethics, scope of practice and evidence-based best practice standards. Professional behaviour expectations and ethical principles related to the professional roles within the healthcare team and the community are examined. Students explore strategies to endorse patient advocacy, social and cultural inclusion. Students explore different avenues for professional development associated to a professional QA program.

Prerequisite(s): none
Corerequisite(s):none

IMG1038 Patient Management for Medical Imaging Professionals

Best practice standards guide the Medical Imaging Professional to provide care to the patient. Students learn the principles of conducting relevant patient assessment to recognize and adapt to diverse patient needs and similarly the legal documentation required. Transmission-based precautions and routine practices of infection control are investigated along with applicable procedures for patients with compromised immunity. Students explore various methods of patient transfers and transport and use of immobilization devices while using proper body mechanics. Students learn to recognize and respond to medical emergencies incorporating the use of assistive devices such as suctioning and oxygen therapy.

Prerequisite(s): none
Corerequisite(s):IMG1039

IMG1039 Patient Management Skills for Medical Imaging Professionals

The support, care and understanding of the patient is the primary role of the Medical Imaging Technologist. Using case scenarios, students practise safe patient transfers and transport methods and apply basic patient assessment skills to ensure patient needs are met. With the use of proper patient interview techniques, the student will determine what interventions are required should a problem arise. Through simulation, the principles of infection control and prevention are rehearsed

based on evidence-based infection control standards. Protocols for basic patient care, such as suctioning and monitoring of vital signs, insertion of rectal tubes along with proper departmental and legal documentation guidelines are performed. The students demonstrate effective communication strategies to deliver appropriate care in diverse patient populations.

Prerequisite(s): none
Corerequisite(s):IMG1038

IMG1043 Practice Foundations for Sonography I

Professionals in the field of sonography require knowledge of their roles and responsibilities. In this course, learners explore the foundation, history and future development of sonography. Learners examine how ergonomics relate to sonographers in practice, and how to apply techniques to prevent work-related musculoskeletal disorders common among sonographers. Basic communication skills and critical-thinking techniques are explored to enhance interactions with the patient, physician and interprofessional healthcare team during sonographic examinations. Preliminary concepts of sonographic impressions are explored along with proper use of permissible medical terms.

Prerequisite(s): none
Corerequisite(s):none

IMG1044 Practice Foundations for Sonography II

Investigating the national standards allows learners to gain knowledge of the sonographer's role in healthcare. Learners explore the scope of practice, the establishment of life-long learning, and the standards of best-practice guidelines for formulating the sonographer's impression. Adaptive communication techniques are explored through case-based learning. Students prepare for clinical training through concepts of basic infection control, emergency codes, privacy and non-violent crisis intervention.

Prerequisite(s): IMG1043
Corerequisite(s):none