Area of Interest: Health Sciences

Diagnostic Medical Sonography

Ontario College Graduate Certificate  Academic Year: 2019/2020
2 Years  Program Code: 1618X01FWO
Ottawa Campus

Our Program

Further your career in diagnostic sonography, exploring theory and clinical practise.

The two-year Diagnostic Medical Sonography Ontario College Graduate Certificate program provides you with the crucial knowledge and technical skills to produce sonographic images and carry out diagnostic procedures.

Diagnostic medical sonography is a diverse and dynamic field of work. Sonographers must be able to work well in stressful situations and think critically. The quality of an ultrasound study is dependent on the skills of the sonographer.

Through theory, simulation, lab practice and many extensive clinical experiences, you learn to produce quality sonographic images. You consider health and safety in your work and apply quality assurance for the safe and proper use of ultrasound.

You have two, 600-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.

This program offers you the hands-on skills you need for success. Algonquin College’s Diagnostic Medical Sonography program is accredited by the Accreditation Canada EQaITM, and graduates from accredited programs are eligible to write the national certification through Sonography Canada and/or the American Registered Diagnostic Medical Sonography.

Upon successful completion of the national certification, you hold the title of Canadian Generalist Sonographer and/or American Registered Diagnostic Medical Sonographer. You may find employment as a:

- diagnostic medical 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.
- Can be self-directed in a team environment.
- Demonstrate proficiency with technology.
- Possess excellent hand-eye coordination.
• Are detail-oriented and conscientious.
• Have strong analytical and perceptual skills.
• Are able to work effectively in challenging and stressful situations.
• Possess the ability to think critically and to self-reflect.

Employment
Graduates may find employment as diagnostic medical 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 exam. Diagnostic Medical Sonography is a regulated profession under the Health Regulated Professions Act in Ontario, and most employers require successful completion of the Sonography Canada certification exams.

Learning Outcomes
The graduate has reliably demonstrated the ability to:

• Produce and assess a variety of high-quality diagnostic images by applying knowledge of anatomical structures, pathology and current technologies.

• Differentiate the sonographic appearance of normal structures from anomalous and pathologic conditions and formulate a detailed technical impression for the reporting physician.

• Complete all work in adherence to professional practise within the scope of the Canadian diagnostic medical sonographer and in accordance with the Sonography Canada National Competency Profile regulatory standards.

• Interpret requests and adapt procedures relative to the patient and the diagnostic image requirements in routine and complex clinical cases.

• Provide quality care to patients in assessment and diagnostic ultrasound imaging while incorporating patient advocacy and education to patients, their family, health care team members and the public.

• Assess patients’ status at all times and respond to emergency situations where indicated.

• Practice safe operating, calibrating, setting up, troubleshooting and evaluating of a variety of complex equipment in consideration of quality assurance principles.

• Analyze a broad range of diagnostic imaging procedures to assist physicians in the diagnosis and management of multiple system disorders.

• Collaborate with members of the interdisciplinary team in the provision of comprehensive patient care.

• Develop strategies for ongoing personal professional development to support lifelong learning.

• 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

<table>
<thead>
<tr>
<th>Level: 01</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMG1001</td>
<td>Cross-Sectional Imaging for Sonography</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG1002</td>
<td>Sonography Physics and Instrumentation I</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG1004</td>
<td>Obstetrical and Gynecological Sonography I</td>
<td>56.0</td>
</tr>
<tr>
<td>IMG1016</td>
<td>Sonography of Superficial Structures</td>
<td>28.0</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>IMG1017</td>
<td>Sonography Skills Laboratory I</td>
<td>126.0</td>
</tr>
<tr>
<td>IMG1019</td>
<td>Foundations for Sonography</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG1034</td>
<td>Abdominal Sonography</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG1035</td>
<td>Professional Practice and Legislation for Medical Imaging Professionals</td>
<td>28.0</td>
</tr>
<tr>
<td>Level: 02</td>
<td><strong>Courses</strong></td>
<td><strong>Hours</strong></td>
</tr>
<tr>
<td>IMG1007</td>
<td>Sonography Physics and Instrumentation II</td>
<td>42.0</td>
</tr>
<tr>
<td>IMG1008</td>
<td>Sonographic Pathology of the Abdomen</td>
<td>56.0</td>
</tr>
<tr>
<td>IMG1018</td>
<td>Sonography Skills Laboratory II</td>
<td>126.0</td>
</tr>
<tr>
<td>IMG1033</td>
<td>Musculoskeletal Sonography</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG1036</td>
<td>Obstetrical and Gynecological Sonography II</td>
<td>56.0</td>
</tr>
<tr>
<td>IMG1037</td>
<td>Vascular Sonography</td>
<td>28.0</td>
</tr>
<tr>
<td>IMG1038</td>
<td>Patient Management for Medical Imaging Professionals</td>
<td>14.0</td>
</tr>
<tr>
<td>IMG1039</td>
<td>Patient Management Skills for Medical Imaging Professionals</td>
<td>14.0</td>
</tr>
<tr>
<td>Level: 03</td>
<td><strong>Courses</strong></td>
<td><strong>Hours</strong></td>
</tr>
<tr>
<td>IMG1013</td>
<td>Clinical Practicum I</td>
<td>600.0</td>
</tr>
</tbody>
</table>

**Fees for the 2019/2020 Academic Year**

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

Further information on fees can be found by visiting the Registrar’s Office site at [http://www.algonquincollege.com/ro](http://www.algonquincollege.com/ro).

Fees are subject to change.

Additional program related expenses include:

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

Books and supplies cost approximately $2,700. See [http://www3.algonquincollege.com/etextbooks](http://www3.algonquincollege.com/etextbooks) for more information about books. Supplies can be purchased at the campus store. The uniform required for clinical site activities costs approximately $150. This program has online learning components requiring students to have a personal computer with Internet connectivity. Please note that parking, travel and accommodations for all clinic activities are the responsibility of the students.

**Admission Requirements for the 2020/2021 Academic Year**

**Program Eligibility**

- Ontario College Diploma, Ontario College Advanced Diploma or Degree in a Medical or Health related field.

- All applicants must complete an assessment through the Test Centre, and will be required to pay the current fee of $50 (subject to change). Results from the health program assessment will be utilized to establish minimum eligibility and also ranked, with the highest ranked applicants given priority admission. The health program assessment can only be written once per academic cycle.

- International applicants must provide proof of the subject specific requirements noted above along with proof of either: (IELTS / TOEFL) 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.

- Applicants with international transcripts must provide proof of the subject specific
• Applicants with international transcripts must provide proof of the subject specific requirements noted above and may be required to provide proof of language proficiency.

**International Applicants:** International applicants who meet the program eligibility requirements are required to complete preparatory courses (4-months in duration): Introduction to Canadian Health Studies (ICHS). Students who successfully complete the introduction will then proceed to their original health program of choice. The ICHS requires applicants to submit an academic IELTS score.

Please click this link for more information: [http://file:///C:/Program%20Files%20(x86)/Algonquin%20College%20(ITS)/Monographs/href=](http://file:///C:/Program%20Files%20(x86)/Algonquin%20College%20(ITS)/Monographs/href=)

Provide evidence of a current Cardio-Pulmonary Resuscitation Training C.P.R. Basic Rescuer ‘C’ Level 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 Medical 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.

**Admission Requirements for 2019/2020 Academic Year**

**Program Eligibility**

- Ontario College Diploma, Ontario College Advanced Diploma or Degree in a Medical or Health related field.

- All applicants must complete an assessment through the Test Centre, and will be required to pay the current fee of $50 (subject to change). Results from the health program assessment will be utilized to establish minimum eligibility and also ranked, with the highest ranked applicants given priority admission. The health program assessment can only be written once per academic cycle.

- International applicants must provide proof of the subject specific requirements noted above along with proof of either: (IELTS / TOEFL) 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.

- Applicants with international transcripts must provide proof of the subject specific requirements noted above and may be required to provide proof of language proficiency.

**International Applicants:** International applicants who meet the program eligibility requirements are required to complete preparatory courses (4-months in duration): Introduction to Canadian Health Studies (ICHS). Students who successfully complete the introduction will then proceed to their original health program of choice. The ICHS requires applicants to submit an academic IELTS score.

**Application Information**

DIAGNOSTIC MEDICAL SONOGRAPHY
Program Code 1618X01FWO
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/](http://www.ontariocolleges.ca/). A $95 fee applies.

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 please visit this link for application process information: [https://algonquincollege.force.com/myACint/](https://algonquincollege.force.com/myACint/).

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
Email: [mailto:AskUs@algonquincollege.com](mailto:AskUs@algonquincollege.com)

**Additional Information**

The College of Medical Radiation Technologists of Ontario has a number of requirements for registration that relate to the past and present conduct of the applicant, as well as mental and physical health conditions. To find out if you would be eligible to practise in Ontario, please access the website: [https://www.cmrto.org/resources/forms/app-ontario-grad](https://www.cmrto.org/resources/forms/app-ontario-grad).

The timetable for this program includes, days, evenings and weekends.

Successful completion of clinical placement is a requirement for graduation from the Diagnostic Medical Sonography program. Clinical placement is completed in the second year of study, over two 16-week terms. Placement start times are staggered, with some placements occurring from May–August and September–November and some occurring from June–September and October–December.

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.

**Course Descriptions**

**IMG1001 Cross-Sectional Imaging for Sonography**

Sonographers co-relate cross-sectional images from multiple modalities to analyze and apply the best possible methodology to current sonograms. Through investigation of cross-sectional relational anatomy, learners take a multi-modality approach to recognize and relate anatomical structures in cross-section to apply in sonographic protocols. Learners explore terminology used in describing anatomy and pathology in relation to surrounding structures and organs.

Prerequisite(s): none
Corequisite(s): IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017 and IMG1019
Diagnostic Medical Sonography

**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): IMG1023 and IMG1024 and IMG1025

**IMG1004 Obstetrical and Gynecological Sonography I**

Sonographers require comprehensive knowledge of the female reproductive system in both gravid and non-gravid conditions. By investigating anatomical structures related to the female reproductive organs in fetal development and the neonatal stage, learners analyze and provide technical impression of normal sonographic images. Learners examine techniques to scan organs of the female reproductive system through cases and demonstrations.

Prerequisite(s): none
Corerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1016 and IMG1017 and IMG1019

**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): IMG1000 (1) and IMG1002 and IMG1023 (1) and IMG1024 (1) and IMG1025 (1)
Corerequisite(s): IMG1029

**IMG1008 Sonographic Pathology of the Abdomen**

Sonographers must possess advanced skills in recognition and analysis of sonographic pathology and normal variants. Through in-depth exploration of related findings, learners correlate prior imaging and lab tests to establish the best approach to scanning. Learners examine, recognize and analyze atypical appearances of abdominal organs and surrounding structures on sonograms.

Prerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017 and IMG1019
Corerequisite(s): IMG1007 and IMG1009 and IMG1037 and IMG1038 and IMG1039

**IMG1013 Clinical Practicum I**

It is necessary for sonographers to be proficient at performing sonography in the clinical environment. Learners integrate applied theoretical knowledge and practical skills 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 sonographer.

Prerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1007 and IMG1008 and IMG1009 and IMG1016 and IMG1017 and IMG1019 and IMG1022 and IMG1023 and IMG1038 and IMG1039
Corerequisite(s): none

**IMG1016 Sonography of Superficial Structures**

Scanning superficial structures is an inherent skill that the generalist sonographer needs to be competent at differentiating normal from abnormal anatomy. Learners explore anatomy related
to superficial structures in detail and observe the proper techniques for scanning and imaging the scrotum, thyroid, breast and other superficial structures.

Prerequisite(s): none
Corerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1017 and IMG1019

**IMG1017 Sonography Skills Laboratory I**

It is essential that sonographers are experts at utilizing sonographic equipment. Under direct supervision and assistance of the instructor, learners gain practical skills introduced in theory and apply these skills to achieve imaging of various organs. In an applied setting, learners achieve proficiency at scanning individual organs of the abdomen, pelvis and superficial structures. Learners are introduced to best practice methods for interacting with patients.

Prerequisite(s): none
Corerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017 and IMG1019

**IMG1018 Sonography Skills Laboratory II**

Essential skills are necessary before integrating into the clinical environment to practice sonography. By scanning various organ systems with direct and indirect supervision, learners expand upon existing skills. Learners perform sonography and duplex Doppler imaging of the lower extremity venous system, advanced abdomen, and extra-cranial arterial system. Through various hands-on projects and simulation, students learn techniques for optimal upper extremity venous imaging and second trimester obstetrical imaging. Communication skills, simulated patient interaction and infection control techniques are taught through various laboratory activities.

Prerequisite(s): IMG1000 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017 and IMG1019
Corerequisite(s): IMG1007 and IMG1008 and IMG1009 and IMG1037 and IMG1038 and IMG1039

**IMG1019 Foundations for Sonography**

Professionals in the field of sonography require knowledge of their roles and responsibilities. In this course, learners explore the foundation and history 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. Investigating the national standards allows learners to gain knowledge of the sonographer’s role in healthcare, the scope of practice, the establishment of life-long learning, and the standards for formulating the sonographer’s impression.

Prerequisite(s): none
Corerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017

**IMG1033 Musculoskeletal Sonography**

The use of sonography for evaluation of musculoskeletal systems is continuously growing. To comprehend sonographic imaging of musculoskeletal ultrasound specific to the generalist sonographer, learners apply current knowledge of anatomy and pathology. Learners examine various scanning techniques and protocols for diagnosis of shoulder, elbow, hand/wrist and foot/ankle pathology. Learners analyze images and formulate technical impressions for interpreting physician.

Prerequisite(s): none
Corerequisite(s): IMG1007 and IMG1008 and IMG1009 and IMG1037 and IMG1038 and IMG1039

**IMG1034 Abdominal Sonography**

Proper imaging requires a thorough knowledge of sonographic anatomy. Learners review anatomical structures of the abdomen and relate the information to sonograms. Learners also develop the ability to assess and recognize normal anatomy on sonographic images. Through examples and demonstrations, learners discover strategies to scan organs of the abdomen in normal patient.
Diagnostic Medical Sonography

Prerequisite(s): none
Corerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016

**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 discussed. Social and cultural awareness as it relates to the sensitivity of diversity in the workplace is examined. Students explore different avenues for professional development associated to a professional QA program.

Prerequisite(s): none
Corerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1019 and IMG1034

**IMG1036 Obstetrical and Gynecological Sonography II**

Recognizing and analyzing abnormalities in fetal development, as well as in the female reproductive system are imperative skills for sonographers. Learners expand upon their knowledge to identify pathology and normal variants within the female reproductive system. The various stages of fetal development are explored up to and including the neonatal stage. By exploring the basics of fetal echocardiography, learners identify variations from the normal fetal heart for technical impression.

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

**IMG1037 Vascular Sonography**

To be successful at vascular sonography, one requires a thorough knowledge and comprehension of the body’s vascular system and its functions. Learners take a comprehensive look at hemodynamic changes that affect spectral analysis and colour Doppler imaging. By exploring the cerebrovascular, peripheral vascular and abdominal vascular systems, learners discover methods for obtaining and analyzing diagnostic sonograms in order to formulate an impression.

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): IMG1000 (1) and IMG1002 (1) and IMG1023 (1) and IMG1024 (1) and IMG1025 (1)
Corerequisite(s): none

**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