Area of Interest: Health Sciences

Diagnostic Medical Sonography

Ontario College Graduate Certificate  Academic Year: 2018/2019
2 Years  Program Code: 1618X01FWO
Ottawa Campus

Our Program

This two-year Ontario College Graduate Certificate program, delivered over 62 consecutive weeks, provides students with the essential knowledge and technical skills required to carry out diagnostic sonography procedures in the role of a Canadian and/or American Registered Diagnostic Medical Sonographer. Working independently and in collaboration with healthcare team members, diagnostic medical sonographers perform and analyze a variety of complex sonographic exams to assist physicians in the diagnosis and management of multiple system disorders.

Through theoretical courses, simulation, laboratory practice and extensive clinical experiences, students acquire the ability to produce quality images of internal structures, such as abdominal and pelvic organs, superficial structures, fetal imaging, carotid arteries and lower extremity venous imaging of the human body. Students apply principles of health and safety, as well as quality assurance for safe and proper use of ultrasound in the clinical setting and develop critical-thinking and problem-solving skills to adapt theoretical knowledge to clinical practice. Students work within an inter-professional healthcare team to deliver safe patient assessment, diagnostic and therapeutic skills consistent with best practice standards for diagnostic medical sonography.

The Algonquin College Diagnostic Medical Sonography program is accredited by the Accreditation Canada EQaITM. Graduates from accredited programs are eligible to write the national certification exams. Upon successful completion of these exams students are credentialed as a Canadian Generalist Sonographer and/or American Registered Diagnostic Medical Sonographer.

Bring Your Own Device (BYOD): Students are expected to have and use a laptop or mobile computing device when registered in this on-campus program. Hardware and software specifications required by your program are outlined at [http://algonquincollege.com/byod](http://algonquincollege.com/byod). Mobile devices/laptops and supplies can be purchased directly from Algonquin’s Connections Bookstore at educational rates.

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, 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, 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 Anatomy for Sonography</td>
<td>30.0</td>
</tr>
<tr>
<td>IMG1002</td>
<td>Sonography Physics and Instrumentation I</td>
<td>45.0</td>
</tr>
<tr>
<td>IMG1003</td>
<td>Abdominal Sonography</td>
<td>60.0</td>
</tr>
<tr>
<td>IMG1004</td>
<td>Obstetrical and Gynecological Sonography I</td>
<td>60.0</td>
</tr>
<tr>
<td>IMG1016</td>
<td>Sonography of Superficial Structures</td>
<td>30.0</td>
</tr>
<tr>
<td>IMG1017</td>
<td>Sonography Skills Laboratory I</td>
<td>135.0</td>
</tr>
<tr>
<td>IMG1019</td>
<td>Professional Practice in Sonography</td>
<td>30.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level: 02</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMG1007</td>
<td>Sonography Physics and Instrumentation II</td>
<td>45.0</td>
</tr>
<tr>
<td>IMG1008</td>
<td>Sonographic Pathology of the Abdomen</td>
<td>60.0</td>
</tr>
<tr>
<td>IMG1009</td>
<td>Obstetrical and Gynecological Sonography II</td>
<td>45.0</td>
</tr>
<tr>
<td>IMG1010</td>
<td>Vascular Sonography</td>
<td>45.0</td>
</tr>
<tr>
<td>IMG1018</td>
<td>Sonography Skills Laboratory II</td>
<td>135.0</td>
</tr>
<tr>
<td>IMG1021</td>
<td>Patient Management for Sonography</td>
<td>30.0</td>
</tr>
</tbody>
</table>
Diagnostic Medical Sonography

<table>
<thead>
<tr>
<th>Level: 03 Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMG1033 Musculoskeletal Sonography</td>
<td>30.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level: 04 Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMG1013 Clinical Practicum I</td>
<td>600.0</td>
</tr>
<tr>
<td>IMG1014 Clinical Practicum II</td>
<td>600.0</td>
</tr>
</tbody>
</table>

**Fees for the 2018/2019 Academic Year**

Program fees listed are for the 2018/2019 Academic Year.

Total Level 01 program fees are $3,456.92 as detailed below:

**Program Fees:**
- Tuition: $1,825.56
- Program Ancillary: $ 192.09
- eText: $ 360.00

**Compulsory Ancillary Fees:**
- Student Activity: $ 217.37
- Sports: $ 72.63
- Technology: $ 159.62
- Transcript: $ 20.00
- Health Services: $ 20.00
- Student Experience: $ 18.00
- Health Plan: $ 153.19 *
- U-Pass: $ 415.04 *
- U-Pass Admin: $ 3.42 *

* Assessed once annually at the beginning of each academic year.

International students pay all fees listed above (excluding the Health Plan fee) plus:
- International Premium: $3,777.00
- International Health Insurance: $ 696.00

Fees are subject to change.

For further fees information please visit: [http://www.algonquincollege.com/ro](http://www.algonquincollege.com/ro).

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 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
• 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.

Admission Requirements for 2018/2019 Academic Year

Program Eligibility

An Ontario College Diploma, Advanced Diploma or Degree in the following:

• Medical Radiation Technology
• Magnetic Resonance Imaging Technology
• Nuclear Medicine Technology
• Advanced Care Paramedic
• Nursing (BScN)
• Respiratory Therapy (3-year program)
• Registered Massage Therapy (3-year program).
• Minimum of three each of Human Anatomy or Physiology
• Minimum of one pathophysiology (Human Pathology)
• Two additional health care courses.

• 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.

• Applicants with International transcripts must provide proof of the subject specific requirements noted above along with proof of either: IELTS-International English Language Testing Service-Overall band of 7.5 with a minimum of 7.0 in each band; OR TOEFL-Internet-based (iBT)-overall 104, with the minimum of 22 in each component: Reading 26; Listening: 26; Speaking 24; Writing: 28.

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:/Wingraph/target=_blank.

ACCEPTED APPLICANTS MUST:

Standard First Aid - you must have a valid Standard First Aid certificate which is valid for a three (3) year period and a Health Care Provider (HCP) CPR C and Automated External Defibrillation
Diagnostic Medical Sonography Certification in order to attend any clinical practice which must remain current for each academic year of your program until graduation. Please note that CPR certification course is specifically designed for Health Care Professionals, course provides training on skills required for Adult, Child, & Infant Resuscitation; One & Two Rescuer, First Aid for Choking, proper use of barrier devices in resuscitation, AED and Bag Valve Mask. Please note that on-line CPR courses do not meet the re-certification standards required for your program.

Accepted applicants must 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 T.B. test (a Chest X-ray is required if the T.B. test is possibility) and are required to have annual immunization for influenza by some clinical affiliates.

Students in the program must be fit-tested for N-95 masks as required by the Ministry of Health and Long Term Care Guidelines.

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:

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

Applications are available online [http://www.ontarioccolleges.ca/](http://www.ontarioccolleges.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, Student Central
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 timetable for this program includes, days, evenings and weekends.

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).

For more information, please contact Sherri Pagnan, Administrative Assistant, at [mailto:pagnans@algonquincollege.com](mailto:pagnans@algonquincollege.com) or 613-727-4723 ext. 5078.

Course Descriptions

IMG1001 Cross-Sectional Anatomy 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 of the human body, learners take a multi-modality approach to recognize and
relate anatomical structures in cross-section. Learners explore terminology used in describing anatomy and pathology in relation to surrounding structures and organs.

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

**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): IMG1001 and IMG1003 and IMG1004 and IMG1016 and IMG1017 and IMG1019

**IMG1003 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.

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

**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): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017 and IMG1019
Corerequisite(s): IMG1008 and IMG1009 and IMG1010 and IMG1021 and IMG1022

**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 IMG1010 and IMG1021 and IMG1022
IMG1009 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): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1017 and IMG1019
Corerequisite(s): IMG1007 and IMG1008 and IMG1010 and IMG1021 and IMG1022

IMG1010 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): IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017
Corerequisite(s): IMG1007 and IMG1008 and IMG1009 and IMG1021 and IMG1022

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 IMG1021 and IMG1022
Corerequisite(s): none

IMG1014 Clinical Practicum II

Sonographers in the clinical setting are experts in their field and work in a competent and professional manner. Learners enhance their technical, professional, interpersonal and patient management skills to function as a member of the healthcare team. Learners fulfill generalist requirements consistent with Sonography Canada Clinical Skills Assessment Manual (CCSA).

Prerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1007 and IMG1008 and IMG1009 and IMG1010 and IMG1013 and IMG1016 and IMG1017 and IMG1018 and IMG1019 and IMG1021 and IMG1022
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.
Diagnostic Medical Sonography

**IMG1018 Sonography Skills Laboratory II**

Essential skills are necessary before advancing into a clinical site to practice sonography. By scanning various organ systems with direct and indirect supervision, learners expand upon existing skills. Learners perform lower extremity venous and carotid duplex Doppler studies, advanced abdomen, 2nd trimester pregnancy (simulation) and sonography of the rotator cuff. Through various hands-on projects, students explore aspects of musculoskeletal and upper extremity venous imaging. Communication skills, simulated patient interaction and infection control techniques are practiced 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 IMG1010 and IMG1021 and IMG1022

**IMG1019 Professional Practice in Sonography**

Professionals in the field of sonography require knowledge of their associated roles and responsibilities. Through exploring the foundations and history of sonography, learners gain knowledge of the sonographer’s role, relate this to inter-professional collaboration and explore the scope of practice for sonography. Learners examine provincial and national organizations’ role in legislation and education pertaining to the profession. In combination of exploration and practice, learners discover processes used in completing accurate documentation to ensure an unmitigated sonographic study. Learners execute patient-centered discussions describing sonographic findings through practice and role playing. By examining privacy legislation and the importance of maintaining patient confidentiality, learners identify common breaches, as well as the consequences of such breaches.

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

**IMG1021 Patient Management for Sonography**

Support, care and understanding of the patient is a primary role of the diagnostic medical sonographer. Learners explore health and safety principles for patients and healthcare team members. Through case studies, enhanced patient assessment, such as patient interview techniques and individualized needs determine if intervention is required when problems arise. The principles of infection transmission are related to evidence-based infection control standards. Protocols for basic patient care, such as administering oxygen, monitoring vital signs, safety transferring patients and legal documentation are reviewed. Learners adapt communication methods for diverse patient populations.

Prerequisite(s): IMG1001 and IMG1002 and IMG1003 and IMG1004 and IMG1016 and IMG1017 and IMG1019
Corerequisite(s): IMG1007 and IMG1008 and IMG1009 and IMG1010 and IMG1021 and IMG1022

**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 IMG1010 and IMG1021