Ordre des technologues en **imagerie médicale**, en **radio-oncologie** et en **électrophysiologie médicale** du Québec

# ENTRY-LEVEL PROFILE

## Medical imaging **TECHNOLOGIST** — Ultrasound

October 2025

**Ordre des technologues en imagerie médicale,**
**en radio-oncologie et en électrophysiologie médicale du Québec**
**(OTIMROEPMQ)**
6455 Jean-Talon Street East | Suite 401
Saint-Léonard, QC  H1S 3E8
Telephone: 514-351-0052 | 1-800-361-8759 | Fax: 514-355-2396

**Note:**

- To interpret this profile correctly, read the document in its entirety and refer to the Code of ethics and the general and specific standards of practice

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# Table of Content

# Introduction

The entry profile to the profession demonstrates the competencies that a medical imaging technologist in the ultrasound field should possess upon entering the profession. It is aimed towards candidates presenting for the admission examination as well as to members of the admission committee of the Ordre des technologues en imagerie médicale, en radio-oncologie et en électrophysiologie médicale du Québec (OTIMROEPMQ).

The entry-level profile is a reference tool to partly serve as orientation for future technologists in their preparatory journey in obtaining their permit to exercise and partly serves to guide the drafting of the scenarios used during the admission examination. It is important to note that these scenarios are representative of the reality of the work environment and aim to evaluate the level of competency attained by the candidates as well as the evaluation of the integration of the theoretical knowledge in practice.

Also, the targeted competencies of the entry-level profile to the profession meet the prescribed current training requirements of the ministry.

> According to the ministère de l'Enseignement supérieur (MES),
>
> The goal of the Medical Ultrasound Technology program is to train medical imaging technologists in the field of medical ultrasound technology. Medical imaging technologists in the field of medical ultrasound technology are healthcare professionals who work in both public establishments (hospitals, university hospitals and CLSCs) and private clinics. Based on a medical prescription, technologists carry out a complete examination by using ultrasound equipment in accordance with the patients' condition and clinical history to acquire optimal medical images, videos and information that radiologists or other specialized physicians use to establish a diagnosis or a treatment plan. Through this expertise, medical imaging technologists in the field of medical ultrasound technology participate in and contribute to the delivery of the services required for patients. Medical ultrasound technologists may practise in the following subsectors of medical ultrasound for adult and pediatric clients:
>
> - abdominal, pelvic and surface ultrasound
> - obstetrical and gynecological ultrasound
> - vascular ultrasound
> - cardiac ultrasound
> - breast ultrasound
> - musculoskeletal ultrasound.

> In their professional practice, medical imaging technologists in the field of medical ultrasound technology may be called upon to perform several types of examinations in all subsectors of medical ultrasound. The goal of the program of study is to enable the student to master the competencies that allow medical imaging technologists to perform a full ultrasound examination, taking charge of the patient throughout the examination, within the limits of professional practice in their field. Communication and close collaboration with radiologists and other specialist physicians responsible for diagnosis, as well as with other health professionals, form an integral part of their work. These technologists may also collaborate with or assist specialist physicians in other types of examinations such as ultrasound-guided medical procedures, e.g. biopsies. As part of their professional practice, medical imaging technologists in the field of medical ultrasound technology may be called upon to train technologists in the same field of expertise as well as other healthcare professionals. They may also conduct or collaborate in research in the field of ultrasound. To obtain their permit to practice their profession, graduates must be members of the Ordre des technologues en imagerie médicale, en radio-oncologie et en électrophysiologie médicale du Québec (OTIMROEPMQ). Pursuant to the Act respecting medical imaging technologists, radiation oncology technologists and medical electrophysiology technologists, certain activities are reserved for members of the Ordre. (Gouvernement du Québec, 2022, P.13)

This document has been updated to reflect the current Sonography Canada Competency (2019) Profile and the 2017 MES Occupational Analysis. It also takes into account Quebec's Medical Imaging, Radiation Oncology and Medical Electrophysiology Technologists Act, applicable regulations and standards of practice as well as OTIMROEPMQ's competency framework.

The Order's competency framework is based on the definition of a professional competence of the Office Québécois de la langue française (OQLF), which describes competence as a combination of knowledge, know-how and professional demeanor in the context of a concrete work situation (OQLF, 2013). It involves the integration of knowledge, skills, attitudes and judgment into real clinical situations that require technologists to solve problems, communicate and think critically to meet patient needs (OTIMROEPMQ, 2018-2019).

The first part of the document is dedicated to the professional profile describing the specific skills a technologist must possess. The detailed competencies are then grouped by theme. Please note that emphasis is placed on the critical thinking and technical gestures that a medical imaging technologist entering the profession must develop to work in partnership with the patient and other professionals in the multidisciplinary team. The proficiency level was based on the revised Bloom taxonomy (see Appendix 4).

Finally, at the end of this document, you will find 6 appendices (laws and regulations; equipment and materials; main examinations; Bloom's taxonomy; abbreviations and probe movements) as well as a bibliography that lists the references governing the profession.

# PROFESSIONAL ATTITUDE

This section is intended to identify specific attitudes that a technologist must have upon entering the profession. It is intrinsic to the routine practice of medical imaging technologist and applies to all sections of this document.

## AUTONOMY

- Show initiative
  (acknowledge and be mindful of tasks to be done,…)
- Take decisions to be efficient in all situations
  (medical emergencies, failed equipment,…)
- Recognize one's limits and be able to seek help from the appropriate resources in order to allow proper management any given situation
- Demonstrate good judgment
- Be organized, responsible and methodical

## ADAPTATION TO THE WORK CONTEXT

- Establish a relationship of trust with various staff
  (co-workers, specialist doctors, biomedical engineers, nurses,…)
- To integrate within the work team
  (adapt to the way co-workers and supervisors proceed, adapt to interdisciplinary and multidisciplinary teams…)
- Establish a relationship of respect with patients, peers and the interdisciplinary/multidisciplinary team
- Adapt to changes
  (team, technological advances, new exam procedures,...)
- Develop stress management and conflict resolution strategies

## VERBAL AND NON-VERBAL COMMUNICATION

- Have the ability to communicate clearly, precisely and adapted to the clientele
- Develop trust
  (with the patient, team,...)
- Is empathetic, patient, respectful and available
- Have good listening skills and demonstrate openness towards others
  (with patients, co-workers,…)
- Control one's emotions while performing daily tasks
- Use verbal and non-verbal communication that is compatible with the professional ethics
- Express oneself in a constructive manner

## COMMITMENT TO THE PROFESSION

- Be interested and motivated
  (conferences, current events,…)
- Demonstrate intellectual and scientific curiosity in one's area of expertise
  (commitment, critical thinking regarding one's daily work,...)
- Maintain one's knowledge up-to-date
- Show attention to detail, is vigilant and meticulous
- Be rigorous

## RULES, ETHICS AND CODE OF ETHICS

- Show ethical behaviour
  (with the patient, peers, supervisors,… )
- Comply with the various laws, regulations, rules and standards
- Respect confidentiality
- Be discrete at all times
- Adopt safe work methods with, co workers and one self

# Competency Statements

## A – PROFESSIONAL PRACTICE

### A-1: DEMONSTRATE CRITICAL THINKING

- **1.1 Consider the patient's condition and the availability of resources to establish case priority** (review the work schedule, communicate with other health professionals responsible for the patient, ensure the material is available,…)
- **1.2 Consider all the elements that could influence the delivery of an exam and intervention** (general anatomy, topography, physiology, pathology, prescription, previous exams, contraindications, equipment, interdisciplinary professionals involved,...)
- **1.3 Adapt procedures based on elements influencing the examination and intervention** (prescription, patient's condition, images and reports from previous exams and related disciplines,…)
- **1.4 Optimize outcomes based on the work context, while respecting established protocols to ensure optimal quality of the services provided to patients** (exams, treatments, procedures...)
- **1.5 Judge the purpose and end result of the examination requested** (context of the examination, patient's condition, data or images obtained, ...)
- **1.6 Provide accurately all pertinent information to the physician in order to make a diagnosis**
- **1.7 Apply problem-solving strategies**
- **1.8 Apply stress management techniques**
- **1.9 Apply conflict resolution techniques**

## A-2: DEMONSTRATE PROFESSIONAL BEHAVIOUR

2.1 **Practice in accordance with legislation, rules and current standards of practice**
(discretion, confidentiality, professional attitude, personal appearance that inspires respect and trust, …)

2.2 **Act only according to an individual or collective prescription signed by a professional entitled to do so by the law**

2.3 **Demonstrate an attitude that is compliant with the standards of professional conduct**
(avoid private conversations, avoid giving impressions or making comments and remarks, preserve the patient's dignity, …)

2.4 **Show respect and sensitivity in both patient and professional interactions**
(stress management, conflict resolution, adapting to change in the work environment, …)

2.5 **Prepare the required locations, equipment, material and accessories before taking the patient into the room**

2.6 **Apply an optimal work method based on the context**
(patient's condition, material availability, maximize efficiency, …)

2.7 **Contribute to self personal professional development**

2.8 **Develop a scientific mind**
(problem-solving, international nomenclature, curiosity, …)

2.9 **Contribute to the management of resources in order to ensure proper functioning of the workstation**
(technologist, physician, assistant, material…)

2.10 **Collaborate with other professionals by establishing good communication, by exchanging relevant information and by performing tasks in the patient's interest**

2.11 **Provide the health professionals involved with relevant information that could be helpful in performing and interpreting the examination or procedure**

2.12 **Help update technical protocols**

2.13 **Participate in the elaboration of new examination techniques or research**

## A-3: CONTRIBUTE TO TRAINING AND PRACTICAL INSTRUCTION

3.1 **Explain the general operation of the department**

3.2 **Justify examination protocols and techniques**

3.3 **Explain the operation of the devices and equipment**

3.4 **Participate in theoretical and practical teaching**

3.5 **Take part in the evaluation process of the trainees**

# B – RESPECT HEALTH AND SAFETY PRINCIPLES

N.B. Respect health and safety principles that applies to each of the points described in this document.

## B-1: MANAGE EQUIPMENT AND SITE RISKS

**1.1 Apply occupational health and safety standards and quality assurance program**
(WHMIS, PDSP, CNESST, GHS, …)

**1.2 Apply the establishments plan for emergency measures**
(emergency codes, disasters, …)

**1.3 Check crash cart and emergency equipment for compliance**
(defibrillator, oxygen tanks, …)

**1.4 Handle biomedical, chemical, pharmaceutical waste according to established standards**

**1.5 Report issues related to equipment and materials**
(see Appendix 2)

**1.6 Maintain a clean and safe work environment**

**1.7 Check safety features**
(emergency buttons, …)

**1.8 Ensure proper storage of equipment and materials**
(probes, gel, medication, …)

**1.9 Ensure proper sterilization of probes**

**1.10 Record any event related to an incident or accident**
(file, records, AH-223 form, …)

## B-2: MANAGE RISKS ASSOCIATED WITH THE PATIENT

2.1 **Apply sterile work methods, if applicable**
2.2 **Provide clinical care in relation to the examination and the procedure**
2.3 **Apply strategies allowing to respond to emergency situations**
(patient vital signs, CPR, agitated patient, emergency measures, …)
2.4 **Monitor the parameters of related devices**
(sphygmomanometer, oxygen, automatic injector, perfusion pump saturometer, ...)
2.5 **Apply immobilization techniques adapted to the patient's age and condition**
2.6 **Use safe movement and transfer techniques to ensure patient safety**
2.7 **Handle accessories in a manner that does not harm patients**
(drip, oxygen, probes, …)
2.8 **Ensure patient comfort and safety**
(immobilization, blanket, pillow, sides of stretcher, …)
2.9 **Maintain visual and auditory contact with the patient at all times**
(avoid injuries, ensure clinical monitoring…)
2.10 **Apply established measures to counter the risk of error that could be detrimental to the patient**
(double identification, human error, mechanical defect, technological failure, …)
2.11 **Record data in patient file**
(patient's condition, side effects, incident, accident, injected subastances, …)

## B-3: APPLY PRINCIPLES OF ERGONOMICS

3.1 **Adopt an ergonomic work posture**
3.2 **Use ergonomic movement and transfer techniques according to the patient's condition** (PDSP)
3.3 **Arrange the workspace in an ergonomic and safe manner**

## B-4: CONTROL INFECTIONS

**4.1 Safely handle pointed or sharp objects, contaminated material and biomedical waste**

**4.2 Dispose of pointed or sharp objects, contaminated material and biomedical waste appropriately**

**4.3 Prevent the transmission of infections at all times by applying basic infection control methods according to the established procedures (see reference document in Appendix 1)** (changing bedding, washing hands, gloves, mask, asepsis, …)

**4.4 Prevent the transmission of infections by applying additional precautionary practices in accordance with established procedures (see reference document in Appendix 1)**
(personal protective clothing, N95 mask, probe sterilization, …)

**4.5 Apply preventive procedures for immunosuppressed patients**

**4.6 Apply infection control techniques to prevent the transmission of micro-organisms for equipment and examination rooms**
(cleaning, disinfection of probes, …)

**4.7 Prioritize actions based on infection prevention**

# C – PERFORM QUALITY CONTROL

## C-1: ASSESS EQUIPMENT PERFORMANCE

**1.1 Apply personal knowledge to operate equipment properly**

**1.2 Apply quality control measures according to manufacturer's schedules or according to needs/ issues**
(phantom test, ...)

**1.3 Communicate quality control test results to resource persons**

**1.4 Record data and test results**

**1.5 Take the necessary corrective actions as required**
(stop the procedure, advise those responsible for quality control, ,...)

**1.6 Help create and update technical files, quality control protocols and maintenance procedures**

**1.7 Perform a daily inspection of each piece of equipment**

**1.8 Perform general maintenance of the appliance**
(clean filters, keyboard, cords, monitor, …)

## C-2: ASSESS IMAGE QUALITY

**2.1 Validate information in the RIS and PACS systems**
(patient identification, letters, pictograms, …)

**2.2 Consider all parameters that influencing image quality**
(artifacts, gain, depth, focal zone, ...)

**2.3 Analyze images in order to improve practice**
(causes of error)

**2.4 Process images**

# D – PATIENT MANAGEMENT

## D-1: GREET PATIENT IN A PROFESSIONAL MANNER

**1.1 Verify the patient's identity using at least two identifiers**
**1.2 Introduce oneself to the patient and clearly identify one's profession**
**1.3 Establish the patient's spoken language and use proper terminology; if needed, request the presence of an interpreter**
**1.4 Evaluate the patient's cognitive, physical and psychological condition**
**1.5 Validate patient preparation**
**1.6 Establish a climate of trust**
(visual contact, auditory, active listening, ...)
**1.7 Respect the patient's privacy**
(close the door to the examination room, validate the questionnaire in a private place, cover the patient, …)
**1.8 Verify with the patient the accuracy of the written information on the requisition for the upcoming examination or intervention**
**1.9 Act in accordance with the code of ethics to avoid any behaviour leading to interpretation and implicating acts of intimacy**
(sexual, psychological, …)
**1.10 Act according to the patient's cognitive, psychological, and physical condition throughout all aspects of the patient's care**

## D-2: ANALYZE THE PATIENT'S REQUISITION AND CHART (ULTRASOUND AND MEDICAL)

**2.1 Verify the conformity of the requisition**
(signature, relevance of the requested examination, contraindications any missing data, patient's name, date, …)
**2.2 Prepare the file based on the planned examination or treatment**
**2.3 Verify patient's medical records (ultrasound) while respecting confidentiality**
(Previous examinations, additional examinations, blood tests, …)
**2.4 Analyze the information on the requisition pertaining to the performance of the examination or intervention**
**2.5 Analyze reports and previous useful images**
**2.6 Correct errors in the patient's chart (ultrasound) after consulting with the physician**
**2.7 Record information relevant to the examination**

## D-3: EXPLAIN THE EXAMINATION TO THE PATIENT AND THE COMPANION

- 3.1 **Give clear explanations of the examination or intervention adapted to the patients needs for information**
- 3.2 **Explain the specific purpose of the examination and intervention**
- 3.3 **Explain the purpose of administering any drugs and/or contrast material, as well as any possible side effects**
- 3.4 **Record the clinical history of the patient**
  (age, symptoms, medications, background, medical history questionnaire, …)
- 3.5 **Validate the contraindications to any aspect to the examination and intervention**
- 3.6 **Provide instructions to ensure the examination and intervention are properly carried out**
- 3.7 **Reassure the patient with regard to the role and proximity of the equipment**
- 3.8 **Answer the patient's questions**
- 3.9 **Validate the patient's understanding**
- 3.10 **Communicate to the patient relative information regarding the follow-up of their file**
- 3.11 **Have the patient remove any objects or clothing that could interfere with the quality of the examination or intervention**
  (piercings,…)
- 3.12 **Ensure the patient's consent to the examination and intervention**

## D-4: MANAGE PRIORITIES

- 4.1 **Establish the order of priorities and update the the examination room's work schedule**
- 4.2 **Verify patient's availability and preparation**
- 4.3 **Notify departments for patient preparations and the synchronization of examinations**
- 4.4 **Reorganize the work schedule according to emergencies**
  (intensive care patients, emergency, …)
- 4.5 **Coordinate patient transportation**

## D-5: ENSURE THE PATIENT FOLLOW UP

- 5.1 **Document observations and relevant information in the chart**
- 5.2 **Communicate relevant information to other professionals involved**
- 5.3 **Convey to the patient the appropriate instructions and recommendations to follow after the examination or intervention**
- 5.4 **Ensure patient care throughout their presence in the ultrasound department**
- 5.5 **Refer the patient to the various resources available or to appointments**
  (other examinations, information leaflets, CLSC, specialists, …)
- 5.6 **Contact the medical specialist to ensure prompt medical care of the patient for any emergency** (venous thrombus, aneurysm, ectopic pregnancy, …)

# E – MANAGE DATA AND IMAGE RECORDING

## E-1: USE ARCHIVING SYSTEMS

**1.1 Record information in patient's medical chart and patient's file**
(RIS, PACS, …)

**1.2 Use the modalities of the system to identify previously performed examinations and related images**
(PACS worklist, …)

**1.3 Add one's signature to endorse the written information and comments in a patient's chart**

**1.4 Apply established procedures in case of patient identification error related to the patient or electronic images**

**1.5 Proceed to the archiving and retrieving of images and data related to the examination**

**1.6 Verify the transfer of images to the archiving system**

# F – MANAGE CONTRAST MEDIA AND MEDICATION

## F-1: ADMINISTER CONTRAST MEDIA SUBSTANCES AND MEDICATION

**1.1 Verify the integrity of the material used for injections and identify any irregularity that could compromise the quality of the act**
(expiry date, …)

**1.2 Select the specific material intended for the various procedures**
(puncture, perfusion, injection, …)

**1.3 Fill out the patient's medical history questionnaire**

**1.4 Consider pharmacological characteristics of the administered drugs and their interaction**

**1.5 Administer contrast media and drugs according to established procedures**
(dosage, dilution, …)

**1.6 Intervene in cases involving reactions to contrast media and drugs**
(extravasation, allergies, …)

**1.7 Document in the medical chart all information related to the administration of contrast media and medications**
(RIS, forms, …)

# G – PARTICIPATE IN INTERVENTIONAL PROCEDURES

## G-1: PARTICIPATE IN PROCEDURES

**1.1 Prepare the equipment and material**
(clamps, catheters, guides, sterile tray, verify expiry dates, oxygen, suction, …)

**1.2 Provide the patient with the necessary care throughout the procedure**
(dressings, securing the catheter, compression, vital signs, …)

**1.3 Apply asepsis principles and sterile material handling techniques**
(sterile drapes setup, working surface, …)

**1.4 Assist the medical specialist**

# H – PERFORM ULTRASOUND EXAMINATIONS

## H-1: ENSURE ECHO PROTECTION

1.1 **Apply echo protection techniques and methods while maintaining the quality of the examination**
(stop the emission of ultrasound, acoustic power, … )

## H-2: PERFORM CARDIAC ULTRASOUND EXAMINATIONS

2.1 **Record patient and examination information**
2.2 **Select the program according to the type of examination**
2.3 **Choose the appropriate ultrasound probe based on the type of examination and anatomical structures to be demonstrated**
2.4 **Perform images of the structures and anatomical regions of interest according to the procedure established for each examination**
(see Appendix 3)
2.5 **Be sure to perform a complete sweep of each organ while scanning**
2.6 **Measure anatomical and pathological structures in a systematic and reproducible manner, according to established procedures**
2.7 **Compare normal values with and without measurement**
2.8 **Adapt technical parameters in order to properly demonstrate each of the anatomical structures**
(depth, gain, focus, …)
2.9 **Use the necessary equipment to optimize image quality**
(necessary amount of gel, …
2.10 **Identify ultrasound images using pictograms, annotations, and digital markers**
2.11 **Perform additional images that complement the planned protocol according to the pathophysiology**
2.12 **Use Doppler mode or any other mode, as needed**
(harmonics, color, M mode, ECG, pulsed wave doppler, …)
2.13 **Complete observation notes and point out any irregularities**
(any variants of normal, structural measurements, …)
2.14 **Apply image processing and reconstructions methods, as needed** (3D, 4D, …)
2.15 **Collaborate with the medical specialist by providing the observation notes**

## H-3: PERFORM ABDOMINAL, PELVIC AND SURFACE ULTRASOUND EXAMINATIONS

**3.1** **Record patient and examination information**

**3.2** **Select the program according to the type of examination**

**3.3** **Choose the appropriate ultrasound probe based on the type of examination and anatomical structures to be demonstrated**

**3.4** **Perform images of the structures and anatomical regions of interest according to the procedure established for each examination**
(see Appendix 3)

**3.5** **Be sure to perform a complete sweep of each organ while scanning**

**3.6** **Measure anatomical and pathological structures in a systematic and reproducible manner, according to established procedures**

**3.7** **Compare normal values with and without measurement**

**3.8** **Adapt technical parameters in order to properly demonstrate each of the anatomical structures**
(depth, gain, focus, …)

**3.9** **Use the necessary equipment to optimize image quality**
(necessary amount of gel, …)

**3.10** **Identify ultrasound images using pictograms, annotations, and digital markers**

**3.11** **Perform additional images that complement the planned protocol according to the pathophysiology**

**3.12** **Use Doppler mode or any other mode, as needed**
(M mode, electrocardiogram, harmonics, …)

**3.13** **Complete observation notes and point out any irregularities**
(any variants of normal, structural measurements, …)

**3.14** **Apply image processing and reconstructions methods, as needed** (3D, 4D, …)

**3.15** **Collaborate with the medical specialist by providing the observation notes**

## H-4: PERFORM OBSTETRICAL AND GYNECOLOGICAL ULTRASOUND EXAMINATIONS

**4.1** **Record patient and examination information**

**4.2** **Select the program according to the type of examination**

**4.3** **Choose the appropriate ultrasound probe based on the type of examination and anatomical structures to be demonstrated**

**4.4** **Perform images of the structures and anatomical regions of interest according to the procedure established for each examination**
(see Appendix 3)

**4.5** **Be sure to perform a complete sweep of each organ while scanning**

**4.6** **Measure anatomical and pathological structures in a systematic and reproducible manner, according to established procedures**

**4.7** **Compare normal values with and without measurement**

**4.8** **Adapt technical parameters in order to properly demonstrate each of the anatomical structures**
(depth, gain, focus, …)

**4.9** **Use the necessary equipment to optimize image quality**
(necessary amount of gel, …)

**4.10** **Identify ultrasound images using pictograms, annotations, and digital markers**

**4.11** **Perform additional images that complement the planned protocol according to the pathophysiology**

**4.12** **Use Doppler mode or any other mode, as needed**
(M mode, electrocardiogram, harmonics, …)

**4.13** **Complete observation notes and point out any irregularities**
(any variants of normal, structural measurements, …)

**4.14** **Apply image processing and reconstructions methods, as needed** (3D, 4D, …)

**4.15** **Collaborate with the medical specialist by providing the observation notes**

## H-5: PERFORM MUSCULOSKELETAL ULTRASOUND EXAMINATIONS

**5.1** **Record patient and examination information**

**5.2** **Select the program according to the type of examination**

**5.3** **Choose the appropriate ultrasound probe based on the type of examination and anatomical structures to be demonstrated**

**5.4** **Perform images of the structures and anatomical regions of interest according to the procedure established for each examination**
(see Appendix 3)

**5.5** **Be sure to perform a complete sweep of each organ while scanning**

**5.6** **Measure anatomical and pathological structures in a systematic and reproducible manner, according to established procedures**

**5.7** **Compare normal values with and without measurement**

**5.8** **Adapt technical parameters in order to properly demonstrate each of the anatomical structures**
(depth, gain, focus, …)

**5.9** **Use the necessary equipment to optimize image quality**
(necessary amount of gel, … )

**5.10** **Identify ultrasound images using pictograms, annotations, and digital markers**

**5.11** **Perform additional images that complement the planned protocol according to the pathophysiology**

**5.12** **Use Doppler mode or any other mode, as needed**
(M mode, electrocardiogram, harmonics, …)

**5.13** **Complete observation notes and point out any irregularities**
(any variants of normal, structural measurements, …)

**5.14** **Apply image processing and reconstructions methods, as needed** (3D, 4D, …)

**5.15** **Collaborate with the medical specialist by providing the observation notes**

## H-6: PERFORM VASCULAR ULTRASOUND EXAMINATIONS

6.1 **Record patient and examination information**
6.2 **Select the program according to the type of examination**
6.3 **Choose the appropriate ultrasound probe based on the type of examination and anatomical structures to be demonstrated**
6.4 **Perform images of the structures and anatomical regions of interest according to the procedure established for each examination**
(see Appendix 3)
6.5 **Be sure to perform a complete sweep of each organ while scanning**
6.6 **Measure anatomical and pathological structures in a systematic and reproducible manner, according to established procedures**
6.7 **Compare normal values with and without measurement**
6.8 **Adapt technical parameters in order to properly demonstrate each of the anatomical structures**
(depth, gain, focus, …)
6.9 **Use the necessary equipment to optimize image quality**
(necessary amount of gel, …)
6.10 **Identify ultrasound images using pictograms, annotations, and digital markers**
6.11 **Perform additional images that complement the planned protocol according to the pathophysiology**
6.12 **Use Doppler mode or any other mode, as needed**
(M mode, electrocardiogram, harmonics, …)
6.13 **Complete observation notes and point out any irregularities**
(any variants of normal, structural measurements, …)
6.14 **Apply image processing and reconstructions methods, as needed** (3D, 4D, …)
6.15 **Collaborate with the medical specialist by providing the observation notes**

## H-7: PERFORM BREAST ULTRASOUND EXAMINATIONS

7.1 **Record patient and examination information**
7.2 **Select the program according to the type of examination**
7.3 **Choose the appropriate ultrasound probe based on the type of examination and anatomical structures to be demonstrated**
7.4 **Perform images of the structures and anatomical regions of interest according to the procedure established for each examination**
(see Appendix 3)
7.5 **Be sure to perform a complete sweep of each organ while scanning**
7.6 **Measure anatomical and pathological structures in a systematic and reproducible manner, according to established procedures**
7.7 **Compare normal values with and without measurement**
7.8 **Adapt technical parameters in order to properly demonstrate each of the anatomical structures**
(depth, gain, focus, …)
7.9 **Use the necessary equipment to optimize image quality**
(necessary amount of gel, …)
7.10 **Identify ultrasound images using pictograms, annotations, and digital markers**
7.11 **Perform additional images that complement the planned protocol according to the pathophysiology**
7.12 **Use Doppler mode or any other mode, as needed**
(M mode, electrocardiogram, harmonics, …)
7.13 **Complete observation notes and point out any irregularities**
(any variants of normal, structural measurements, …)
7.14 **Apply image processing and reconstructions methods, as needed** (3D, 4D, …)
7.15 **Collaborate with the medical specialist by providing the observation notes**

# Appendix 1: Rules and Regulations

1. Act respecting medical imaging technologists, radiation oncology technologists and medical electrophysiology technologists. Document available at : https://www.legisquebec.gouv.qc.ca/fr/document/lc/T-5

2. Professional Code Document available at : https://www.legisquebec.gouv.qc.ca/fr/document/lc/C-26

3. Code of ethics of medical imaging technologists, radiation oncology and medical electrophysiology technologists. Document available at : https://www.legisquebec.gouv.qc.ca/fr/document/rc/T-5,%20r.%205

4. Règlement sur la formation continue des membres de l'Ordre des technologues en imagerie médicale, en radio-oncologie et en électrophysiologie médicale du Québec. Document available at : https://www.legisquebec.gouv.qc.ca/fr/document/rc/T-5,%20r.%209

5. Routine Practice and Additional Precautions for Preventing the transmission of Infection in Healthcare Settings. Government of Canada Canada. Document available at : https://www.canada.ca/en/public-health/services/publications/diseases-conditions/routine-practices-precautions-healthcare-associated-infections.html

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# Appendix 2: Equipment and Materials

## EQUIPMENT

| |
|---|
| Ultrasound machine |
| Multiparametric machine with multiple armbands (BP, O2 saturation, T, …) |
| Stretcher |
| Ergonomic chair |
| Probe |
| Disinfectant |
| Gel |
| Sterile material |
| Probe sterilization equipment |
| Protective personal equipment (gowns, gloves, masks, …) |
| Oxygen |
| Suction |
| Linen |
| Probe cover |
| Pillow |
| Storage |
| Computer |
| Etc. |

# Appendix 3: List of main examinations

## ULTRASOUND EXAMINATIONS

**Anatomical parts**

| | |
|---|---|
| **Abdominal Ultrasound** | Pancreas |
| | Liver, hepatic veins, portal vein |
| | Gallbladder intra and extra hepatic bile ducts |
| | Kidneys and adrenals |
| | Aorta, inferior vena cava, other vessels |
| | Spleen |
| | Peritoneal and retroperitoneal cavity |
| | Abdominal wall |
| | Intestines |
| | Lymph nodes |

| | |
|---|---|
| **Pelvic Ultrasound** | Bladder |
| | Uterus, ovairies, Fallopian tubes |
| | Peritoneal and retroperitoneal cavity |
| | Prostate, seminal vesicles |

| | |
|---|---|
| **Surface Ultrasound** | Thyroid Gland |
| | Breast |
| | Testicules |
| | Skin surface |
| | Inguinal |
| | Lymph nodes |

| | |
|---|---|
| **Transfontanelle Ultrasound** | Fontanelle |
| | Brain |

| | |
|---|---|
| **Obstetrical Ultrasound 1st trimester** | Amniotic fluid |
| | Yolk sac |
| | Number of fetuses, membranes and gestational sacs |
| | Placenta, cervix, ovaries |
| | Heart, large vessels |
| | Nuchal Translucency, nasal bone |
| | Abdomen, umbilical cord insertion, stomach, bladder, diaphragm, lungs |
| | 4 limbs |
| | Head (ventricles, choroid plexus, …) |
| | Spine |

| | |
|---|---|
| **Obstetrical Ultrasound 2nd trimester** | Amniotic fluid |
| | Placenta, cervix, ovaries |
| | Heart, four cardiac chambers, large vessels |
| | Soft tissue of neck |
| | Nasal bone, nose, mouth |
| | Abdomen, umbilical cord, kidneys, stomach, bladder, diaphragm |
| | Fetal biometry (4 limbs, measurement of limbs…) |
| | Head (cerebellum, ventricles, choroid plexus, cisterna magna, …) |
| | Spine |
| | Fetomaternal circulation analysis (uterine arteries, umbilical cord, …) |
| | Sexe |

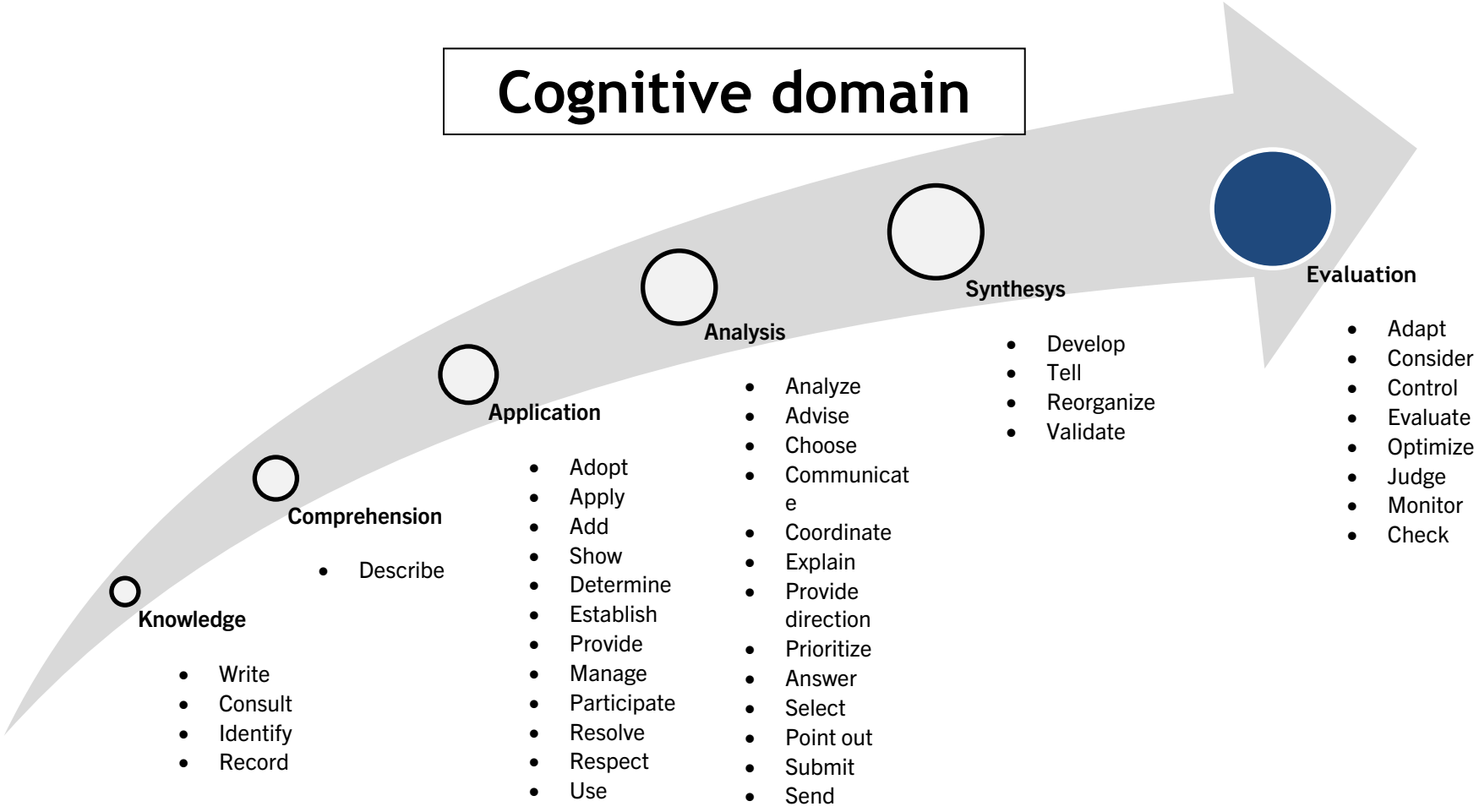
| | |
|---|---|
| **Obstetrical Ultrasound 3rd trimester** | Amniotic fluid |
| | Placenta, cervix |
| | Heart, four cardiac chambers, large vessels |
| | Nasal bone, nose, mouth |
| | Abdomen, umbilical cord, kidneys, stomach, bladder, diaphragm |
| | Fetal biometry |
| | Head (cerebellum, ventricles, …) |
| | Spine |
| | Fetomaternal circulation analysis (uterine arteries, umbilical cord, …) |
| | Biophysical profile (fetal movements, fetal respiration, …) |
| | Fetal position |

| | |
|---|---|
| **Cardiac and Vascular Ultrasound** | Carotid arteries, jugular veins |
| | Venous vascular: upper and lower extremities |
| | Arterial vascular: upper and lower extremities |
| | Heart chambers, heart valves, … |
| | Large vessels, pulmonary vein |
| | Heart walls |

| | |
|---|---|
| **Musculoskeletal Ultrasound** | Articulations, synovial space, bone |
| | Muscles, tendons, meniscus |

| | |
|---|---|
| **Pleural Ultrasound** | Layers of pleura |
| | Diaphragm |
| | Lungs |

# Appendix 4: Taxonomy



| | |
|---|---|
| **PSYCHOMOTOR** | Act / React |
| | Dispense care |
| | Execute |
| | Handle |
| | Manipulate |
| | Perform |
| | Position |
| | Proceed |
| | Take action |
| | Treat |

| | |
|---|---|
| **AFFECTIVE DOMAIN** | Introduce oneself to patient |
| | Preserve |
| | Raise awareness |
| | Respect |

# Appendix 5: Abbreviations

**Abdominal, pelvic and surface Ultrasound**
**Cardiac Ultrasound and obstetrical ultrasound**
**Vascular Ultrasound**

| Abbreviation and symbol | Complete word / meaning |
|---|---|
| [ ] | Concentration |
| °C | Degree Celsius |
| ♀ | Female |
| ♂ | Male |
| A.A.A | Abdominal aortic aneurysm |
| A/P | Antero-posterior |
| AB | Abortion |
| Abd/ABD, abdo. | Abdomen or abdominal |
| ABFB | Aortobifemoral bypass |
| abx | Antibiotic |
| AC | Abdominal circumference |
| adm | Admission |
| AF | Atrial fibrillation/Amniotic fluid |
| AFI | Amniotic fluid index |
| AFIB | Atrial fibrillation |
| AFP | Alpha fetoprotein |
| AGN | Acute glomerulonephritis |
| AI | Aortic insufficiency |
| all. | Allergy |
| AMI | Acute myocardial infarction |
| ant. | Anterior |
| Ao | Aorta |
| APN | Acute pyelonephritis |
| APO | Acute pulmonary oedema |
| ARF/ AKI | Acute renal failure/ Acute kidney injury |
| ART | Assisted reproduction technique or technology |
| ARVD | Arrhythmogenic Right Ventricular Dysplasia |
| ASCVD | Atherosclerotic Cardiovascular Disease |

| | |
|---|---|
| ASD | Atrial septal defect |
| Asym. | Asymmetric |
| ATB | Antibiotic |
| ATCD | Previous medical background history |
| ATN | Acute tubular necrosis |
| AU | Uterine artery |
| AVA | Aortic valve area |
| AVCD | Atrioventricular canal defect |
| AVF | Arteriovenous fistula |
| AVR | Aortic valve replacement |
| BAV | Bicuspid aortic valve |
| Bil. | Bilateral |
| BMI | Body mass index |
| BP | Blood pressure |
| BPD | Biparietal diameter |
| BPH | Benign prostatic hyperplasia |
| BPM | Beats per minute |
| BPP | Biophysical profile |
| BSO | Bilateral Salpingo-Oophorectomy |
| Bx | Biopsy |
| C/S | Cesarean section |
| Ca | Cancer |
| Ca+ | Calcium |
| CABG | Coronary artery bypass graft |
| CAD | Coronary artery disease |
| Cath. | Catheterization, catheter |
| CBC | Complete blood count |
| CCAM/CPAM | Congenital cystic adenomatoid malformation |
| CHF | Congestive heart failure |
| CKD/ CRF | Chronic kidney disease/ chronic renal failure |
| CLL | Chronic lymphoid leukemia |
| CM | Certified Midwife |
| CMV | Cytomegalovirus |
| CNS | Central nervous system |
| coll | Collateral |
| comp | Compression |
| comp. | Compression |
| COPD | Chronic obstructive pulmonary disease |
| Coro | Coronarography |
| CP | Chest pain |

| | |
|---|---|
| CRL | Crown rump length |
| CRP | C-reactive protein |
| CT | Computed tomography |
| CTX | Contractions |
| CVA | Cerebral vascular accident |
| CVD | Cardiovascular disease |
| CVI | Chronic venous insufficiency |
| CVP | Central venous pressure |
| Cx | Circumflex coronary artery |
| DA | Ductus arteriosus vs descending aorta? (Depends on context) |
| DCM | Dilated cardiomyopathy |
| DD | Dorsal decubitus |
| decub. | Decubitus |
| DIA, D | Diameter |
| Diab. | Diabetic |
| DM | Diabetes mellitus |
| DNT | Did not test |
| DOB | Date of birth |
| DV | Ductus venosus |
| DVT | Deep vein thrombosis |
| dx | Diagnosis |
| E. coli | Escherichia coli |
| EBL | Estimated blood loss |
| EBV | Epstein-Barr virus |
| ECG | Electrocardiogram |
| EDD | Expected due date or expected date of delivery |
| EDV | End diastolic volume |
| EEG | Electroencephalogram |
| EF | Ejection fraction |
| EFW | Estimated fetal weight |
| EGD | Esophagogastroduodenoscopy |
| EKG/ECG | Electrocardiogram |
| EP | Ectopic pregnancy |
| ERCP | Endoscopic retrograde cholangiopancreatography |
| ERO | Effective regurgitant orifice |
| ESV | End systolic volume |
| ETOH | Ethyl alcohol |
| F/U | Follow up |

| | |
|---|---|
| FH | Fetal heart |
| FH | Fundal height |
| FH or FHx | Family history |
| FL | Femur length |
| FM | Fetal movement |
| FSH | Follicle-stimulating hormone |
| Fx / # | Fracture |
| GDM | Gestational diabetes mellitus |
| GERD | Gastroesophageal reflux disease |
| GGT | Gamma-glutamyl transpeptidase |
| GH | Growth hormone |
| GI | Gastro-intestinal |
| Gluc., glu, BG | Glucose, blood glucose |
| GN | Gram-negative |
| GP | Gram-positive |
| GTPAL | GTPAL Gravita, term, preterm, abortion, living |
| gyn | Gynecology |
| HAV | Hepatitis A virus |
| Hb , Hgb | Hemoglobin |
| HBV | Hepatitis B virus |
| HC | Head circumference |
| hCG | Human chorionic gonadotropin |
| HCM | Hypertrophic cardiomyopathy |
| HCT | Hematocrit |
| HELLP | Hemolysis, elevated liver enzymes and low platelets |
| HF | Heart failure |
| HIV | Human immunodeficiency virus |
| HL | Humerus length |
| HN | Hydronephrosis |
| HPV | Human papillomavirus |
| HR | Heart rate |
| HTN | Hypertension |
| Hx | History |
| IABP | Intra-aortic balloon pump |
| IBD | Inflammatory bowel disease |
| ICD | Implantable cardioverter defibrillator |
| IDDM | Insulin-dependant diabetes mellitus |
| IE | Infective endocarditis |

| | |
|---|---|
| IH | Intracranial hypertension |
| inf | Inferior |
| Insuf. | Insufficiency |
| intl | Internal |
| IP | Intraperitoneal |
| IUD | Intrauterine device |
| IUFD | Intrauterine fetal demise |
| IUGR | Intrauterine growth restriction (aka fetal growth restriction) |
| IV | Intravenous |
| IVC | Inferior vena cava |
| IVF | In vitro fertilization |
| L (circled)/ Lt. | Left |
| LA | Left atrium |
| LAA | Left atrial appendage |
| lat | Lateral |
| LBBB | Left bundle branch block |
| LBP | Lower back pain |
| LD | Lateral decubitus |
| LE | Lower extremity |
| LGIB | Lower gastrointestinal bleeding |
| LHF | Left heart failure |
| LIF | Left iliac fossa |
| LLDP | Left lateral decubitus position |
| LLE | Left lower extremity |
| LLE | Lower limb edema/Left lower extremity |
| LLQ | Left lower quadrant |
| LMP | Last menstrual period |
| LN | Lymph node |
| LOF | Leakage of fluid |
| LUE | Left upper extremity |
| LUE | Left upper extremity |
| LV | Left ventricle |
| LVH | Left ventricle hypertrophpy |
| LVEF | Left ventricular ejection fraction |
| LVF | Left ventricular failure |
| LVOT | Left ventricular outflow tract |
| M/C | Miscarriage |
| MCA | Middle cerebral artery |
| MI | Myocardial infarction/Mitral insufficiency |

| | |
|---|---|
| Microbiol. | Microbiology |
| MR | Mitral regurgitation |
| MRI | Magnetic resonance imaging |
| MRSA | Methicillin-resistant staphylococcus aureus |
| MVA | Mitral valve area |
| MVR | Mitral valve replacement |
| N (circled) | Normal |
| N&V | Nausea and vomiting |
| N/A | Non applicable |
| NASH | Non Alcoholic Steatohepatitis |
| Neg. - | Negative |
| NG tube | Nasogastric tube |
| NIDDM | Non-insulin-dependent diabetes |
| Nil | Nothing |
| NPO | Nothing by mouth |
| NS | Nephrotic syndrome |
| NSAID | Non steroidal anti-inflammatory drug |
| NST | Prenatal nonstress test |
| NSTEMI | Non-ST elevated myocardial infarction |
| NT | Nuchal translucency |
| Ø | None |
| OH | Orthostatic hypotension |
| P | Pain |
| PAC | Pre atrial contraction |
| PAF | Paroxysmal atrial fibrillation |
| PDA | Patent ductus arteriosus or posterior descending artery (depends on context) |
| PE | Physical exam/Pulmonary embolism/Pericardial effusion (depends on context) |
| PFO | Patent foramen ovale |
| PH | Pulmonary hypertension |
| PHT | Portal hypertension/Pressure half-time |
| PI | Pulmonary insufficiency |
| PID | Pelvic inflammatory disease |
| PISA | Proximal isovelocity surface area |
| PMC | Pseudomembranous colitis |
| POCS | Polycystic ovary syndrome |
| post | After |
| post. | Posterior |
| postop | Postoperative (after surgery) |

| | |
|---|---|
| PPE | Personal protective equipment |
| PPM | Permanent pacemaker |
| PR | Pulmonic regurgitation |
| pre | Before |
| Preop | Preoperative (before surgery) |
| PROM | Premature rupture of membranes |
| PS | Pulmonary stenosis |
| PSA | Prostate-specific antigen |
| PTCA | Percutaneous transluminal coronary angioplasty |
| PTL | Preterm labor |
| PV | Pulmonary vein/Per vaginam |
| PVC | Premature ventricular contraction |
| PVD | Peripheral vascular disease |
| R (circled)/ Rt. | Right |
| R/O | Rule out |
| RA | Right atrium |
| RBBB | Right bundle branch block |
| RBC | Red blood cells |
| RCM | Restrictive cardiomyopathy |
| RHF | Right heart failure |
| RIF | Right iliac fossa |
| RLE | Right lower extremity |
| RLQ | Right lower quadrant |
| RSA/LSA | Right subclavian artery/ Left subclavian artery |
| RSI | Repetitive strain injury |
| RUE | Right upper extremity |
| RUP or LUP | Right upper quadrant or left upper quadrant |
| RV | Right ventricle |
| RVol | Regurgitant volume |
| RVOT | Right ventricular output track |
| SAH | Subarachnoid hemorrhage |
| SAM | Systolic anterior motion |
| SDH | Subdural hematoma |
| SFD | Small-for-dates |
| SHD | Structural heart disease |
| SLG | Strain longitudinal global |
| STEMI | ST elevated myocardial infarction |
| STI/STBBI | Sexually transmitted infection/ sexually transmitted blood borne infections |

| | |
|---|---|
| SUA | Single umbilical artery |
| Sup/ S | Superior |
| SVT | Superficial vein thrombosis |
| Sx | Surgery/Symptoms |
| sym. | Symmetric |
| T° | Temperature |
| T13, T18 and T21 | Trisomy 13, trisomy 18 et trisomy 21 |
| TAH | Total abdominal hysterectomy |
| TAHBSO | Total Abdominal Hysterectomy and Bilateral Salpingo-Oophorectomy |
| TAPSE | Tricuspid annular plane systolic excursion |
| TAVR/TAVI | Transcatheter aortic valve replacement/implant |
| TB | Tuberculosis |
| TDI | Tissue doppler |
| TEE | Transesophageal echocardiography |
| TGA | Transposition of the great arteries |
| TIA | Transient ischemic attack |
| TIPS | Transhepatic Intrajugular Portosystemic Shunt |
| TR | Tricuspid regurgitation |
| TS | Tricuspid stenosis |
| TTE | Transthoracic echocardiography |
| TTTS | Twin-to-twin Transfusion syndrome |
| TUR | Transurethral resection |
| TURB | Transurethral resection of bladder |
| TURBT | Transurethral resection of bladder tumour |
| TURP | Transurethral resection of prostate |
| TVH | Total vaginal hysterectomy |
| TVP | Temporary transvenous pacing |
| Tx | Treatment |
| UA | Umbilical artery/Umbilical artery doppler |
| UE | Upper extremity |
| UGIB | Upper gastrointestinal bleeding |
| ULE | Upper limb edema |
| US, U/S | Ultrasound |
| v. | Vein |
| vasc. | Vascular |
| VBAC | Vaginal birth after cesarean section |
| VBI | Vertebrobasilar insufficiency |
| VD | Ventral Decubitus |

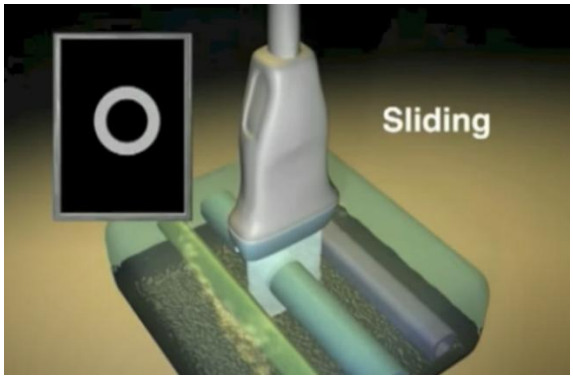
| | |
|---|---|
| VFIB | Ventricular fibrillation |
| VGE | Viral Gastroenteritis |
| VP | Venipuncture |
| VRE | Vancomycin resistant enterococcus |
| vs | Versus |
| VSD | Ventricular septal defect |
| VT | Ventricular tachycardia |
| VTE | Venous thromboembolism |
| VTI | Velocity time integral |
| WBC | White blood cell |
| WPW | Wolfe-Parkinson-White |
| YS | Yolk sac |
| ΔP | Pression gradient |
| ↑ | Increase |
| ↓ | Decrease |

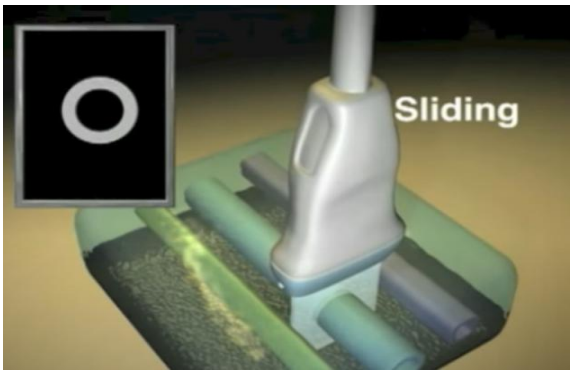
# Appendix 6 : Movements of the probe

**Sliding/Displacement**

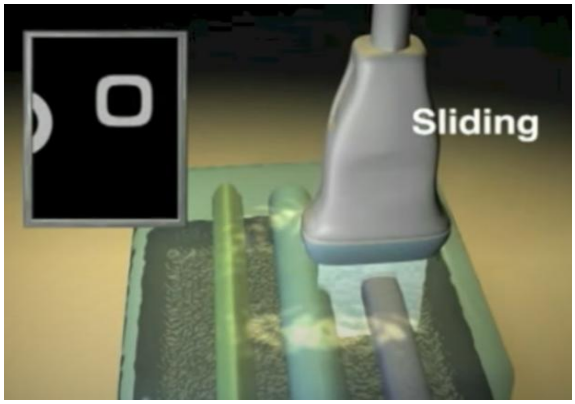
Displacement of the probe perpendicular to the patient in longitudinal or transverse.

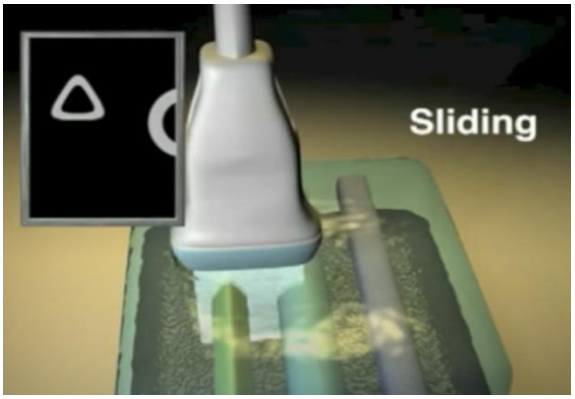
**Possible from top to bottom**




[1]**Possible from right to left and vice-versa**



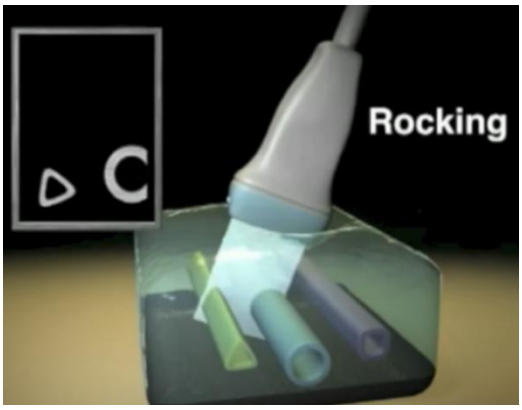

[1] Images are from screenshots of the following TouTube video : Buntinx, Jan (2013). *Manipuler la sonde*, vidéo accessible à l'adresse suivante : Manipuler la sonde - YouTube

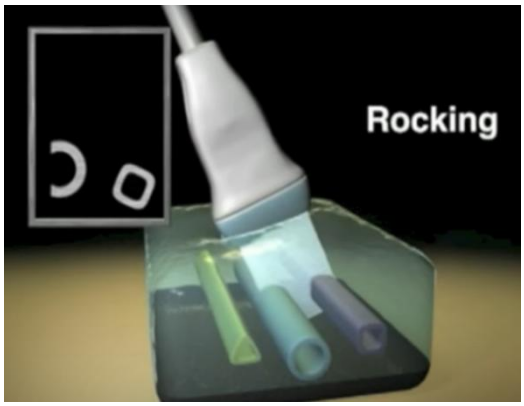
**Rocking the probe from right to left and vice-versa**

Allows you to sweep through a structure by leaving the probe positioned in one place. Rocking movement of the probe from right to left or vice-versa.

Possible in longitudinal and in transverse.

The rocking motion allows the ultrasound beam to pass below an ultrasound obstacle such as air in the intestinal loops or a rib.

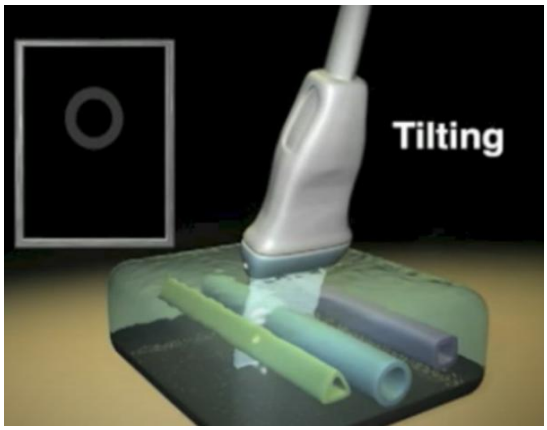


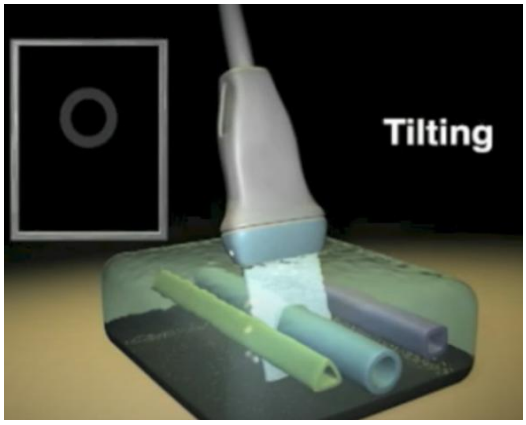




**Tilting of the probe from top to bottom or vice-versa**

Tilting of the probe from top to bottom or vice-versa (Cephalad or caudal when the probe is in transverse and from left to right when the probe is in longitudinal)

[2] Tilting allows the ultrasound beam to pass under an ultrasound obstacle such as air in the intestinal loops for the study of the aorta and ribs.




[2] Images are from screenshots of the following TouTube video : Buntinx, Jan (2013). *Manipuler la sonde*, vidéo accessible à l'adresse suivante : Manipuler la sonde - YouTube

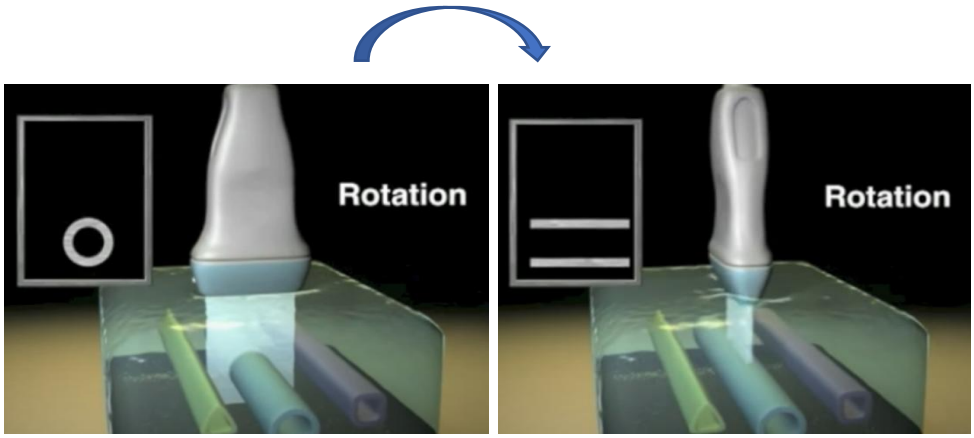
**Probe pivot and probe rotation**

This movement makes it possible to switch from a longitudinal view to a transverse view when the pivot is 90 degrees counterclockwise.

Allows you to switch from a transverse view to a longitudinal view when the pivot is 90 degrees clockwise.

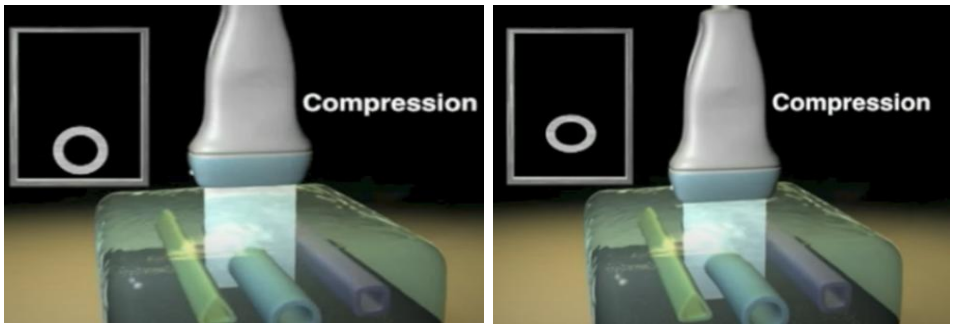
Movement of great amplitude. Small and large rotational movements allow the probe to be adjusted so that it is in the desired axis.

Pivot movements are also used to adjust a longitudinal view or a transverse view of a structure to be perfectly in line with the axis of the structure. These are small range of motion movements.




**Compression**

Compress harder with the probe on the patient to reduce the space between the structure and the probe. This also allows for the air in the intestinal loops to be displaced and have better contact between the probe and the skin surface.




[3]

[3] Images are from screenshots of the following TouTube video : Buntinx, Jan (2013). *Manipuler la sonde*, vidéo accessible à l'adresse suivante : Manipuler la sonde - YouTube

# Glossary

**Competency:** According to the Quebec Ministry of Education, Recreation and Sport (2006), a competency is defined as "an acting knowledge based on the effective mobilization and use of a set of resources" (p.4). According to LeBoterf (2008) "To be competent is to be able to act and succeed competently in a work situation (activity to be carried out, event to be faced, problem to be solved, project to be carried out…). It means implementing a relevant professional practice while mobilizing an appropriate combination of resources (knowledge, skills, behaviours, reasoning methods, etc.) (p.21). According to Scallon (n.d.), "to be said to be "competent," an individual must have done something: production, process, and process on several occasions." It also defines competence as "the ability to mobilize a set of resources (internal (knowledge, skills, strategies, skills) and external (documents, experts, Internet, other students)) in order to deal with a complex set of situations».
[Traduction libre]

**Entry-level competency:** Skills required for a technologist entering the profession on day 1.

**Medical record:** A record containing all the patient's medical information recorded by their physician. It includes data collected during consultations, surgeries, sampling, etc.

**Patient record (or clinical record):** The patient record or clinical record is the record that only clinicians or their team can have access. It was commonly referred to as radiology record for the radiology field or radiation oncology record for the radiation oncology field. It must include all the information described in *l'article 6 du Règlement sur la tenue des dossiers, des registres et des cabinets de consultation et sur la cessation d'exercice d'un membre de l'Ordre des technologues en imagerie médicale, en radio-oncologie et en électrophysiologie médicale du Québec.*

**Prescription:** The term "prescription" means an individual or group prescription made by a professional authorized by law, having as its subject in particular the medicines, treatments, examinations and care required, the circumstances in which they may be issued, as well as possible contraindications. (Professional Code: section 39.3).

**Interdisciplinarity:** The interaction between two or more disciplines, which can range from the simple communication of ideas to the mutual integration of the directing concepts of epistemology, terminology, methodology, processes, data and the orientation of related research and teaching (Grand dictionnaire terminologique, OQLF)

**Multidisciplinary:** Bringing together several sciences and fields in research or teaching (Grand dictionnaire terminologique, OQLF)

**Skills and attitudes:** A technologist who demonstrates a good professional attitude acts according to his or her ability to perform in all the elements necessary for competence (OTIMROEPMQ, 2010).
[Traduction libre]

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