



# Sonography

## 1. Introduction

Candidates applying for certification and registration are required to meet the Professional Education Requirements specified in the *ARRT Rules and Regulations*. ARRT's *Sonography Didactic and Clinical Competency Requirements* are one component of the Professional Education Requirements.

The requirements are periodically updated based upon a [practice analysis](#) which is a systematic process to delineate the job responsibilities typically required of sonographers. The result of this process is a [task inventory](#) which is used to develop the clinical competency requirements (see section 4 below) and the content specifications which serve as the foundation for the didactic competency requirements (see section 3 below) and the examination.

## 2. Documentation of Compliance

Verification of program completion, including Didactic and Clinical Competency Requirements and all degree-related requirements including conferment of the degree, will be completed on the Program Completion Verification Form on the ARRT Educator website after the student has completed the Application for Certification and Registration.

Candidates who complete their educational program during 2024 or 2025 may use either the 2019 Didactic and Clinical Competency Requirements or the 2024 requirements. Candidates who complete their educational program after December 31, 2025, must use the 2024 requirements.

## 3. Didactic Competency Requirements

The purpose of the didactic education requirement is to document that individuals have had the opportunity to develop fundamental knowledge, integrate theory into practice, and hone affective and critical thinking skills required to demonstrate professional competence. Candidates must successfully complete coursework addressing the topics listed in the [ARRT Content Specifications](#) for the Sonography Examination. These topics would typically be covered in a nationally recognized curriculum published by organizations such as Joint Review Committee on Education in Diagnostic Medical Sonography (JRC-DMS). Educational programs accredited by a mechanism acceptable to ARRT generally offer education and experience beyond the minimum requirements specified in the content specifications and clinical competency requirements.

## 4. Clinical Competency Requirements

The purpose of the clinical competency requirements is to document that individuals have demonstrated competence performing the clinical activities fundamental to a particular discipline. Competent performance of these fundamental activities, in conjunction with mastery of the cognitive knowledge and skills as documented by the examination requirement, provides the basis for the acquisition of the full range of procedures typically required in a variety of settings. Demonstration of clinical competence means that the candidate has performed the procedure independently, consistently, and effectively during the course of their formal education. The following pages identify the specific procedures for the clinical competency requirements. Candidates may wish to use these pages, or their equivalent, to record completion of the requirements. The pages do NOT need to be sent to the ARRT.



## **4.1 General Performance Considerations**

### **4.1.1 Patient Diversity**

Demonstration of competence should include variations in patient characteristics such as age, gender, and medical condition.

### **4.1.2 Simulated Performance**

The ARRT requirements specify that certain clinical procedures may be simulated as designated in the specific requirements below. Simulations must meet the following criteria:

- ARRT defines simulation of a clinical procedure routinely performed on a patient as the candidate completing the hands-on task of the procedures on a live human being, using the same level of cognitive, psychomotor, and affective skills required for performing a procedure on a patient in a clinical setting standardized to mirror the physical facilities where practice occurs.
- ARRT requires that competencies performed as a simulation must meet the same criteria as competencies demonstrated on patients. For example, the competency must be performed under direct observation of the program director or program director's designee and be performed independently, consistently, and effectively.

### **4.1.3 Elements of Competence**

Demonstration of clinical competence requires that the program director or the program director's designee has observed the candidate performing the procedure independently, consistently, and effectively during the course of the candidate's formal educational program.

## **4.2 Sonography Specific Requirements**

As part of the educational program, candidates must demonstrate competence in the clinical activities identified below:

- Five mandatory patient care procedures and be BLS/CPR certified;
- Six mandatory scanning techniques;
- Two mandatory equipment care activities;
- 11 mandatory imaging procedures; and
- Nine elective imaging procedures selected from a list of 20 procedures.

These clinical activities are listed in more detail in the following sections.



#### 4.2.1 Mandatory Patient Care Procedures, Scanning Techniques, and Equipment Care Activities

Candidates are required to be BLS/CPR certified. They must also demonstrate competence in the remaining five patient care procedures, six scanning techniques, and two equipment care activities. The activities should be performed on patients whenever possible, but simulation is acceptable if state or institutional regulations prohibit candidates from performing the procedures on patients.

| <b>Mandatory Patient Care Procedures</b>          | <b>Date Completed</b> | <b>Competence Verified By</b> |
|---|-----------------------|-------------------------------|
| BLS/CPR certification                             |                       |                               |
| Vital signs (blood pressure, pulse, respiration)  |                       |                               |
| Monitoring level of consciousness and respiration |                       |                               |
| Standard Precautions                              |                       |                               |
| Sterile technique                                 |                       |                               |
| Verification of informed consent                  |                       |                               |
| <b>Mandatory Scanning Techniques</b>              | <b>Date Completed</b> | <b>Competence Verified By</b> |
| Gray scale (2D)                                   |                       |                               |
| Color Doppler                                     |                       |                               |
| Power Doppler                                     |                       |                               |
| Spectral Doppler                                  |                       |                               |
| M-Mode  |                       |                               |
| *Ergonomic evaluation                             |                       |                               |
| <b>Mandatory Equipment Care</b>                   | <b>Date Completed</b> | <b>Competence Verified By</b> |
| Prepare transducer for intracavitary use          |                       |                               |
| Clean and disinfect transducer                    |                       |                               |

*\*The candidate should be evaluated for appropriate ergonomic scanning techniques according to the following: [“Industry Standards for the Prevention of Work Related Musculoskeletal Disorders in Sonography.”](#)*



#### 4.2.2 Sonography Procedures

Candidates must demonstrate competence in the 11 mandatory procedures listed in the following table. Candidates are also required to demonstrate competence for nine of the 19 elective procedures. Multiple competencies may be demonstrated on one patient or volunteer.

When performing the sonography procedures, the candidate must demonstrate appropriate:

- patient preparation, including evaluation of requisition or medical record, preparation of exam room, identification of patient, infection control procedures, patient assessment, and instruction concerning the procedure;
- exam protocol, including patient positioning, sonographic technique, parameter selection, image display, image annotation and labeling, archiving, and documentation of procedure;
- image evaluation, including image quality, optimal demonstration of anatomic region and pathology, and exam completeness.

Where possible, all procedures should be performed on patients; however, up to four of the 20 procedures that are eligible for simulation may be performed on volunteers (simulated), as long as your institution has a policy that assures the protection of both the volunteer's and the institution's interest. Procedures identified as "Eligible for Simulation" on the chart below may be simulated.

The candidate's clinical education should include variation in patient characteristics, provide ample opportunity for demonstration of both normal and variant anatomy, as well as important pathologies and medical conditions. A variety of instructional methods may be useful for teaching the clinical skills identified in this document.

Those procedures marked with an \* must include the required structures listed in the Appendix.

| <b>Abdomen</b>                                | <b>Mandatory</b> | <b>Elective</b> | <b>Date Completed</b> | <b>Eligible for Simulation</b> | <b>Competence Verified By</b> |
|---|------------------|-----------------|-----------------------|--------------------------------|-------------------------------|
| Abdomen complete*                             | ✓                |                 |                       |                                |                               |
| Renal*  | ✓                |                 |                       |                                |                               |
| Right upper quadrant*                         |                  | ✓               |                       |                                |                               |
| Gastrointestinal tract (e.g., appendix)       |                  | ✓               |                       |                                |                               |
| Prostate                                      |                  | ✓               |                       |                                |                               |
| <b>Superficial Structures</b>                 | <b>Mandatory</b> | <b>Elective</b> | <b>Date Completed</b> | <b>Eligible for Simulation</b> | <b>Competence Verified By</b> |
| Scrotum and testes                            | ✓                |                 |                       |                                |                               |
| Breast and axilla                             |                  | ✓               |                       |                                |                               |
| Superficial masses                            | ✓                |                 |                       |                                |                               |
| Thyroid                                       | ✓                |                 |                       | ✓                              |                               |
| Salivary glands (e.g., parotid)               |                  | ✓               |                       | ✓                              |                               |
| Musculoskeletal                               |                  | ✓               |                       | ✓                              |                               |
| Non-cardiac chest (e.g., pleural space, lung) | ✓                |                 |                       | ✓                              |                               |



**4.2.2 Sonography Procedures (continued)**

| <b>Gynecology</b>                          | <b>Mandatory</b>                                 | <b>Elective</b> | <b>Date Completed</b> | <b>Eligible for Simulation</b> | <b>Competence Verified By</b> |
|--|--|-----------------|-----------------------|--------------------------------|-------------------------------|
| Uterus                                     | ✓  |                 |                       |                                |                               |
| Adnexa (including ovaries)                 | ✓  |                 |                       |                                |                               |
| <b>Obstetrics</b>                          | <b>Mandatory</b>                                 | <b>Elective</b> | <b>Date Completed</b> | <b>Eligible for Simulation</b> | <b>Competence Verified By</b> |
| First trimester*                           | ✓  |                 |                       |                                |                               |
| Second trimester*                          | ✓  |                 |                       | ✓                              |                               |
| Third trimester*                           | ✓  |                 |                       | ✓                              |                               |
| Fetal biophysical profile                  |  | ✓               |                       | ✓                              |                               |
| <b>Interventional Procedures</b>           | <b>Mandatory</b>                                 | <b>Elective</b> | <b>Date Completed</b> | <b>Eligible for Simulation</b> | <b>Competence Verified By</b> |
| Biopsy                                     |  | ✓               |                       |                                |                               |
| Aspiration                                 |  | ✓               |                       |                                |                               |
| Drainage procedures                        |  | ✓               |                       |                                |                               |
| <b>Vascular Procedures</b>                 | <b>Mandatory</b>                                 | <b>Elective</b> | <b>Date Completed</b> | <b>Eligible for Simulation</b> | <b>Competence Verified By</b> |
| Post catheterization complication          |  | ✓               |                       |                                |                               |
| Upper extremity venous Doppler*            |  | ✓               |                       | ✓                              |                               |
| Lower extremity venous Doppler*            |  | ✓               |                       | ✓                              |                               |
| Carotid Doppler*                           |  | ✓               |                       | ✓                              |                               |
| <b>Pediatric</b>                           | <b>Mandatory</b>                                 | <b>Elective</b> | <b>Date Completed</b> | <b>Eligible for Simulation</b> | <b>Competence Verified By</b> |
| Head                                       |  | ✓               |                       | ✓                              |                               |
| Spine                                      |  | ✓               |                       | ✓                              |                               |
| Hips                                       |  | ✓               |                       | ✓                              |                               |
| Pyloric stenosis                           |  | ✓               |                       | ✓                              |                               |
| Bowel (intussusception, appendix)          |  | ✓               |                       | ✓                              |                               |
| <b>Total Mandatory Procedures Required</b> | 11 of 11   |                 |                       |                                |                               |
| <b>Total Elective Procedures Required</b>  | 9 of 19  |                 |                       |                                |                               |
| <b>Total # of Simulations Allowed</b>      | 4 of 20 required exams (mandatory plus elective) |                 |                       |                                |                               |



**Appendix**

The following is a list of procedures along with the structures to be included in each procedure. **REQUIRED** structures listed must be included in the procedure to demonstrate clinical competence. Although **OPTIONAL** structures are not required to be demonstrated, they may be included in the procedure, if appropriate.

| PROCEDURES                        | REQUIRED STRUCTURES | OPTIONAL STRUCTURES                                       |
|-----------------------------------|---------------------|---|
| <b>Abdomen Complete</b>           |                     |   |
|                                   | liver               | adrenals  |
|                                   | gallbladder         | urinary bladder   |
|                                   | common bile duct    | abdominal wall  |
|                                   | pancreas            | other vasculature (e.g., hepatic, renal, aortic branches) |
|                                   | kidneys             |   |
|                                   | aorta               |   |
|                                   | inferior vena cava  |   |
|                                   | spleen              |   |
|                                   | main portal vein    |   |
| <b>Renal</b>                      |                     |   |
|                                   | kidneys             | aorta   |
|                                   | urinary bladder     | inferior vena cava  |
|                                   |                     | adrenals  |
|                                   |                     | other vasculature (e.g., renal, aortic branches)          |
| <b>Right Upper Quadrant</b>       |                     |   |
|                                   | liver               | aorta   |
|                                   | gallbladder         | inferior vena cava  |
|                                   | common bile duct    |   |
|                                   | pancreas            |   |
|                                   | right kidney        |   |
|                                   | main portal vein    |   |
| <b>First Trimester Obstetrics</b> |                     |   |
|                                   | gestational sac     |   |
|                                   | yolk sac            |   |
|                                   | crown rump length   |   |
|                                   | fetal heart rate    |   |
|                                   | uterus              |   |
|                                   | ovaries             |   |



| <b>Second Trimester Obstetrics</b>    |  |                                 |
|---------------------------------------|--|---------------------------------|
|                                       | placenta   | right ventricular outflow tract |
|                                       | biparietal diameter                                      | left ventricular outflow tract  |
|                                       | head circumference                                       | cerebral ventricles             |
|                                       | abdominal circumference                                  | cerebellum                      |
|                                       | femur length   | cisterna magna                  |
|                                       | four chamber heart                                       | nose/lips                       |
|                                       | cardiac motion   | nuchal fold                     |
|                                       | stomach  | extremities                     |
|                                       | kidneys  | aorta                           |
|                                       | bladder  | liver                           |
|                                       | umbilical cord insertion                                 | gallbladder                     |
|                                       | umbilical cord vessels                                   | spleen                          |
|                                       | maternal cervix  | spine                           |
|                                       | maternal uterus  | amniotic fluid evaluation       |
|                                       |  | maternal adnexa                 |
| <b>Third Trimester Obstetrics</b>     |  |                                 |
|                                       | amniotic fluid index (AFI)/maximum vertical pocket (MVP) | right ventricular outflow tract |
|                                       | placenta   | left ventricular outflow tract  |
|                                       | biparietal diameter                                      | nose/lips                       |
|                                       | head circumference                                       | extremities                     |
|                                       | abdominal circumference                                  | spine                           |
|                                       | femur length   | maternal cervix                 |
|                                       | four chamber heart                                       | maternal adnexa                 |
|                                       | cardiac motion   |                                 |
|                                       | stomach  |                                 |
|                                       | kidneys  |                                 |
|                                       | bladder  |                                 |
| <b>Upper Extremity Venous Doppler</b> |  |                                 |
|                                       | internal jugular vein                                    | brachiocephalic vein            |
|                                       | subclavian vein  | radial veins                    |
|                                       | axillary vein  | ulnar veins                     |
|                                       | brachial veins   |                                 |
|                                       | cephalic vein  |                                 |
|                                       | basilic vein   |                                 |



| <b>Lower Extremity Venous Doppler</b> |                         |                        |
|---------------------------------------|-------------------------|------------------------|
|                                       | common femoral vein     | external iliac vein    |
|                                       | profunda femoral vein   | small saphenous vein   |
|                                       | femoral vein            | peroneal veins         |
|                                       | great saphenous vein    | posterior tibial veins |
|                                       | popliteal vein          |                        |
| <b>Carotid Doppler</b>                |                         |                        |
|                                       | common carotid artery   | subclavian artery      |
|                                       | external carotid artery |                        |
|                                       | internal carotid artery |                        |
|                                       | vertebral artery        |                        |