Sonography

1. Introduction

ARRT requires candidates applying for certification and registration under the primary eligibility pathway 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.

ARRT periodically updates the requirements based on 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

After the candidate submits the *Application for Certification and Registration*, the program director (and authorized faculty member if required) will verify that ARRT requirements were met using the Program Verification Form on the ARRT Educator website. The verification includes confirming the applicant has completed the educational program, including the ARRT Didactic and Clinical Competency Requirements and conferment of a degree meeting ARRT requirements. Candidates who complete their educational program during 2028 or 2029 may use either the 2024 Didactic and Clinical Competency Requirements or the 2028 requirements. Candidates who complete their educational program after December 31, 2029, must use the 2028 requirements.

3. Didactic Competency Requirements

The purpose of the didactic education requirement is to document that individuals had the opportunity to develop fundamental knowledge, integrate theory into practice, and hone affective and critical thinking skills required to demonstrate professional competency. 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 documents.

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.

General Requirement: Remote scanning is not acceptable for completion of ARRT Clinical Requirements. The candidate must complete the examination or procedure at the facility where the patient and equipment are located. The candidate must be physically present during the examination or procedure.

For sonography clinical competency requirements procedures, the program director or the program director's designee must directly observe the candidate performing the procedure. The observation must occur in person, with both the candidate and the program director or designee physically present at the same location. Remote observation or virtual presence is not acceptable for verification of clinical competency procedures.

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.

Remote scanning is not acceptable for completion of ARRT Clinical Requirements. The candidate must complete the examination or procedure at the facility where the patient and equipment are located. The candidate must be physically present during the examination or procedure.

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~~ or ACLS certified;
- Six mandatory scanning techniques;
- Two mandatory equipment care activities;
- 10~~11~~ mandatory imaging procedures; and
- 10~~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~~ or ACLS 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.

Mandatory Patient Care Procedures	**Date Completed**	**Competence Verified By**
BLS~~/CPR certification~~ or ACLS Certified		
Vital signs (blood pressure, pulse, respiration)		
Monitoring level of consciousness ~~and respiration~~		
Standard Precautions		
Sterile technique		
Verification of informed consent		
Mandatory Scanning Techniques	**Date Completed**	**Competence Verified By**
Grayscale (2D)		
Color Doppler		
Power Doppler		
Spectral Doppler		
M-Mode		
*Ergonomic evaluation		
Mandatory Equipment Care	**Date Completed**	**Competence Verified By**
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 10~~11~~ mandatory procedures listed in the following table. Candidates are also required to demonstrate competence for 10~~nine~~ of the 20~~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, (e.g., ~~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 (e.g., ~~including~~ patient positioning),
- sonographic technique,
- parameter selection,
- image display,
- image annotation and labeling,
- archiving, and documentation of procedure;
- image evaluation (e.g.,~~, 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 ~~19~~16 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.

Abdomen	**Mandatory**	**Elective**	**Date Completed**	**Eligible for Simulation**	**Competence Verified By**
Abdomen complete*	✓				
Renal*	✓				
Right upper quadrant*		✓			
Bowel ~~Gastrointestinal tract~~ (e.g., appendix)		✓			
Prostate		✓			

Superficial Structures	**Mandatory**	**Elective**	**Date Completed**	**Eligible for Simulation**	**Competence Verified By**
Scrotum and testes	✓				
Breast and axilla		✓			
Superficial masses	~~✓~~	✓			
Thyroid	✓			✓	
Salivary glands (e.g., parotid)		✓		✓	
Musculoskeletal		✓		✓	
Non-cardiac chest (e.g., pleural space~~, lung~~)	✓			✓	

Gynecology	**Mandatory**	**Elective**	**Date Completed**	**Eligible for Simulation**	**Competence Verified By**
Uterus	✓				
Adnexa (including ovaries)	✓				
Obstetrics	**Mandatory**	**Elective**	**Date Completed**	**Eligible for Simulation**	**Competence Verified By**
First trimester*	✓			✓	
Second trimester*	✓			✓	
Third trimester*	✓			✓	
Fetal biophysical profile		✓		✓	
Interventional Procedures	**Mandatory**	**Elective**	**Date Completed**	**Eligible for Simulation**	**Competence Verified By**
Biopsy		✓			
Aspiration		✓			
Drainage procedures		✓			
Vascular Procedures	**Mandatory**	**Elective**	**Date Completed**	**Eligible for Simulation**	**Competence Verified By**
Post ~~catheterization~~ procedure complication		✓			
Upper extremity venous Doppler*		✓		✓	
Lower extremity venous Doppler*		✓		✓	
Carotid Doppler*		✓		✓	

Pediatric	**Mandatory**	**Elective**	**Date Completed**	**Eligible for Simulation**	**Competence Verified By**
Head		✓		✓	
Spine		✓		✓	
Hips		✓		✓	
Pyloric stenosis		✓		✓	
Bowel (intussusception, appendix)		✓		✓	
Total Mandatory Procedures Required	~~11of 11~~10 of 10				
Total Elective Procedures Required	~~9 of 19~~10 of 20				
Total # of Simulations Allowed	4 of 20 required exams (mandatory plus elective)				

Appendix

The following table ~~is a~~ lists ~~of~~ procedures ~~along~~ and specifies ~~with~~ the structures to be included in each procedure. To demonstrate clinical competence, the candidate must include all **REQUIRED** structures ~~listed must be included~~ in the procedure ~~to demonstrate clinical competence~~. Although candidates do not need to demonstrate **OPTIONAL** structures ~~are not required to be demonstrated~~, they may ~~be~~ include~~d~~ them in the procedure, ~~if~~when appropriate.

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

Second Trimester Obstetrics		
	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~~
	cerebral ventricles	maternal adnexa
	cerebellum	humerus length
	cisterna magna	
	nose/lips	
	spine	
	amniotic fluid evaluation	
	extremities	
Third Trimester Obstetrics		
	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	umbilical cord insertion
	stomach	umbilical cord vessels
	kidneys	
	bladder	
	maternal cervix	
	spine	
	extremities	

Upper Extremity Venous Doppler		
	internal jugular vein	brachiocephalic vein
	subclavian vein	radial veins
	axillary vein	ulnar veins
	brachial veins	
	cephalic vein	
	basilic vein	
Lower Extremity Venous Doppler		
	common femoral vein	external iliac vein
	profunda femoral vein	small saphenous vein
	femoral vein	peroneal veins
	great saphenous vein	posterior tibial veins
	popliteal vein	anterior tibial veins
		gastrocnemius veins
Carotid Doppler		
	common carotid ~~artery~~arteries	subclavian ~~artery~~arteries
	external carotid ~~artery~~arteries	
	internal carotid ~~artery~~arteries	
	vertebral ~~artery~~arteries	