



Vascular Sonography

1. Introduction

Candidates for certification and registration are required to meet the Professional Education Requirements specified in the *ARRT Rules and Regulations*. ARRT's *Vascular 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 vascular 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

To document that the Didactic and Clinical Competency Requirements have been satisfied by a candidate, the program director (and authorized faculty member if required) must sign the ENDORSEMENT SECTION of the *Application for Certification and Registration*.

3. Didactic Competency Requirements

The purpose of the didactic competency requirements is to verify 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 Vascular Sonography Examination. These topics would typically be covered in a nationally-recognized curricula 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 here.

4. Clinical Competency Requirements

The purpose of the clinical competency requirements is to verify that individuals certified and registered by the ARRT have demonstrated competency 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 covered by the vascular sonography examination, 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 his or her 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:

- The candidate must competently demonstrate skills as similar as circumstances permit to the cognitive, psychomotor, and affective skills required for performing the procedures on patients;
- The program director must be confident that the skills required to competently perform the simulated task will generalize or transfer to the clinical setting, and, if applicable, the candidate must evaluate related images.

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 Vascular Sonography Specific Requirements

As part of the educational program, candidates must demonstrate competence in the clinical activities identified below. These clinical activities are listed in more detail in the following sections.

- Five mandatory patient care procedures and be CPR certified;
- Four mandatory scanning techniques;
- One mandatory equipment care activity;
- 39 mandatory imaging procedures; and
- 19 elective imaging procedures selected from a list of 37 procedures.



4.2.1 Mandatory Patient Care Requirements and Scanning Techniques

Candidates are required to be CPR certified. They must also demonstrate competence in the remaining five patient care activities, four scanning techniques, and one equipment care activity. 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
CPR Certification		
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
Gray Scale (2D)		
Color Doppler		
Power Doppler		
Spectral Doppler		
Mandatory Equipment Care	Date Completed	Competence Verified By
Clean and disinfect transducer		

4.2.2 Vascular Sonographic Procedures

Candidates must demonstrate competence in the 39 mandatory procedures listed in the following table. For the mandatory procedures, candidates must be evaluated while scanning actual patients. Candidates are also required to demonstrate competence for 19 of the 36 elective procedures. Elective procedures should be performed on patients; however, up to one-half of the elective procedures may be performed on volunteers, as long as your institution has a policy that assures the protection of both the volunteer's and the institution's interests. Multiple competencies may be demonstrated on one patient or volunteer.

When performing the vascular 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 (i.e., Standard Precautions), 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; and
- image evaluation, including image quality, optimal demonstration of anatomic region and pathology, and exam completeness.

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.



4.2.2 Vascular Sonographic Procedures (continued)

Abdomen/Pelvic Vasculature					
Arterial	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Aorta	✓				
Celiac		✓			
Hepatic		✓			
Splenic		✓			
Superior/inferior mesenteric		✓			
Renal	✓				
Common iliac	✓				
Internal iliac		✓			
External iliac	✓				
Venous	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Inferior vena cava	✓				
Hepatic	✓				
Portal	✓				
Splenic		✓			
Superior mesenteric		✓			
Renal	✓				
Common iliac	✓				
Internal iliac		✓			
External iliac	✓				
Transplant Vasculature					
	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Liver		✓			
Kidney		✓			
Upper Extremity Vasculature					
Arterial	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Brachiocephalic		✓			
Subclavian	✓				
Axillary	✓				
Brachial	✓				
Radial	✓				
Ulnar		✓			
Palmar arch (with Allen test)		✓			



4.2.2 Vascular Sonographic Procedures (continued)

Upper Extremity Vasculature (continued)					
Venous	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Internal jugular	✓				
Brachiocephalic		✓			
Subclavian	✓				
Axillary	✓				
Brachial	✓				
Cephalic	✓				
Basilic	✓				
Radial		✓			
Ulnar		✓			
Vein mapping		✓			
Lower Extremity Vasculature					
Arterial	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
External iliac	✓				
Common femoral	✓				
Superficial femoral	✓				
Deep femoral	✓				
Popliteal	✓				
Tibioperoneal trunk	✓				
Posterior tibial	✓				
Anterior tibial	✓				
Peroneal	✓				
Dorsalis pedis	✓				
Venous	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
External iliac	✓				
Common femoral	✓				
Femoral	✓				
Deep femoral	✓				
Popliteal	✓				
Great saphenous	✓				
Small saphenous		✓			
Calf veins	✓				
Vein mapping		✓			
Reflux assessment		✓			



4.2.2 Vascular Sonographic Procedures (continued)

Neck Vasculature					
	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Carotid artery (includes CCA, ICA, ECA)	✓				
Vertebral artery	✓				
Stress/Pressure Testing					
	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Segmental pressures (upper extremities)		✓			
Segmental pressures (lower extremities)		✓			
Ankle-Brachial Index (ABI)		✓			
Toe-Brachial Index (TBI)		✓			
Pulse Volume Recording (PVR)		✓			
Post-exercise testing		✓			
Photoplethysmography (PPG)		✓			
Post Intervention Procedures					
	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Bypass grafts*		✓			
Post catheterization complications*		✓			
Endografts*		✓			
Dialysis access grafts/fistulae*		✓			
Stents*		✓			
TIPS*		✓			
Post endarterectomy*		✓			
Interventional Procedures					
	Mandatory	Elective	Date Completed	Patient or Simulated	Competence Verified By
Vein ablations*		✓			
Pseudoaneurysm treatment (compression or guided thrombin injection)*		✓			

*This competency must be performed on a patient.