



Vascular Sonography

Certification and registration requirements for Vascular Sonography are based on the results of a comprehensive practice analysis conducted by The American Registry of Radiologic Technologists (ARRT) staff and the Sonography/Vascular Sonography Practice Analysis Advisory Committee. The purpose of the practice analysis is to identify job responsibilities typically required of vascular sonographers at entry into the profession. In 2016, the ARRT surveyed a large national sample of vascular sonographers. The results of the practice analysis are reflected in this document. The attached task inventory is the foundation for both the clinical requirements and the content specifications.

Basis of Task Inventory

The practice analysis survey was used to identify the responsibilities typically required of vascular sonographers. When evaluating survey results, the advisory committee applied a 40% guideline. That is, to be included on the task inventory an activity must have been the responsibility of at least 40% of vascular sonographers. The advisory committee could include an activity that did not meet the 40% criterion if there was a compelling rationale to do so (e.g., a task that falls below the 40% guideline but is expected to rise above the 40% guideline in the near future).

Application to Clinical Requirements

The purpose of the clinical requirements is to verify that candidates have completed fundamental clinical procedures in vascular sonography. Successful performance of these fundamental procedures, in combination with mastery of the cognitive knowledge and skills covered by the vascular sonography examination, provides the basis for acquisition of the full range of clinical skills required in a variety of settings. An activity must appear on the task inventory to be considered for inclusion in the clinical requirements. For an activity to be designated as a mandatory requirement, survey results had to indicate that the vast majority of vascular sonographers performed that activity. The advisory committee designated clinical activities performed by fewer vascular sonographers, or which are carried out only in selected settings, as elective. The clinical requirements are available on ARRT's website (www.arrt.org).

Application to Content Specifications

The purpose of the Vascular Sonography Examination is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of vascular sonographers at entry into the profession. The content specifications identify the knowledge areas underlying performance of the tasks on the task inventory. Every content category can be linked to one or more activities on the task inventory. Note that each activity on the task inventory is followed by a content category that identifies the section of the content specifications corresponding to that activity. The content specifications are available on ARRT's website (www.arrt.org).



| Activity | Content Categories |
|---|---------------------------|
| 1. Properly sequence procedures to avoid situations that adversely affect vascular procedures. | PC.1.B.3. |
| 2. Access and review pertinent patient data (*e.g., electronic medical records, patient charts, previous procedures/reports) for correlation with vascular sonographic studies. | PC.1.A.2.A. |
| 3. Maintain confidentiality of patient information (e.g., HIPAA). | PC.1.A.1.B. |
| 4. Verify procedure ordered is appropriate for clinical symptoms. | PC.1.A.2.A. |
| 5. Confirm patient's identity. | PC.1.A.2.A. |
| 6. Explain patient preparation (e.g., diet restrictions, preparatory medications, allergies) prior to a vascular procedure. | PC.1.B.3. |
| 7. Explain procedure to patient and/or patient's family. | PC.1.B.3.A. |
| 8. Interview patient to acquire clinical history. | PC.1.B. |
| 9. Conduct physical and mental assessment of patient to enhance the vascular procedure. | PC.1.C.3.B. |
| 10. Provide for patient comfort and modesty. | PC.1.C. |
| 11. Ensure compliance with American Hospital Association (AHA) Patient Care Partnership (Patients' Bill of Rights). | PC.1.A.1.C. |
| 12. Follow <i>ARRT Standards of Ethics</i> . | PC.1.A.3. |
| 13. Monitor auxiliary equipment (e.g., IVs, supplement oxygen) to support patient's need while in the department. | PC.1.C. |
| 14. Use proper body mechanics and/or mechanical transfer devices when assisting patients. | PC.1.C.1.A. |
| 15. Use proper ergonomics when performing vascular procedures. | PC.1.C.4. |
| 16. Explain breathing instructions as needed for obtaining optimal images. | PC.1.B.3. |
| 17. Enter patient identification and clinical information into vascular equipment and/or PACS prior to procedure. | IP.1.B. |
| 18. Select equipment and accessories for the procedure requested. | IP.1.A. |
| 19. Set TGC, power and amplification to achieve optimal image quality, and minimize patient exposure to acoustic energy. | PC.1.F., IP.2. |
| 20. Use the following enhanced sonographic techniques as appropriate: a. volume flow (e.g., hemodialysis fistulas) b. Doppler twinkle (e.g., stone recognition). | IP.2.E.5., IP.3.A.3.B. |
| 21. Select Doppler setting to achieve optimal image quality. | IP.1.A.5.B., IP.3.C. |
| 22. Evaluate patient's ability to comply with positioning requirements for the requested procedure. | PC.1.C. |
| 23. Select immobilization devices or positioning aids, when indicated, to prevent patient movement and/or ensure patient safety. | PC.1.A.2.D. |

* The abbreviation "e.g.," is used to indicate that examples are listed in parentheses, but that it is not a complete list of all possibilities.



| Activity | Content Categories |
|---|---|
| 24. Position patient to demonstrate the desired anatomy. | PC.1.C.1. |
| 25. Modify techniques for circumstances such as body habitus and artifacts inherent to the patient, pathological conditions, and/or patient's inability to cooperate. | PC.1.C.3.B. |
| 26. Use annotation to indicate anatomical planes, patient position, or other relevant information. | IP.3. |
| 27. Verify that informed consent is obtained when necessary. | PC.1.A.1.A., PC.1.G.3. |
| 28. Verify that a time-out procedure is performed when necessary. | PC.1.G.2. |
| 29. Recognize signs and symptoms of abnormal respiratory rate, pulse, and blood pressure, and notify appropriate personnel. | PC.1.C.3., PC.1.D. |
| 30. Measure respiratory rate, pulse, or blood pressure when appropriate. | PC.1.C.3.A. |
| 31. Utilize Standard Precautions. | PC.1.E.3. |
| 32. Follow appropriate procedures when in contact with a patient in isolation. | PC.1.E.5.B. |
| 33. Use sterile or aseptic technique on or near wounds, surgical dressings, drains, or hardware. | PC.1.E. |
| 34. Use sterile or aseptic technique to prevent contamination of sterile trays, instruments, or fields. | PC.1.E.2.D. |
| 35. Clean, disinfect, or sterilize transducer and equipment. | PC.1.E.2.A., PC.1.E.2.B., PC.1.E.3.C. |
| 36. Properly dispose of contaminated items. | PC.1.E., PC.1.E.3.D. |
| 37. Maintain accurate patient log. | PC.1.A., PC.1.C.3. |
| 38. Evaluate vascular studies for diagnostic quality. | IP.3.A. |
| 39. Evaluate vascular studies for artifacts and determine if any artifact(s) has an effect on the diagnostic quality of the examination. | IP.3.A.3. |
| 40. Take corrective measures if vascular studies are not of diagnostic quality. | IP.3.A. |
| 41. Recognize and report any limitations of the vascular procedure performed. | IP.3.A. |
| 42. Recognize and report malfunctions in the vascular equipment, accessories, and PACS. | IP.1.B.3. |
| 43. During the vascular procedure, select representative images demonstrating normal anatomy, and/or variants, and/or pathological conditions. | IP.3. |
| 44. Determine if additional areas should be evaluated sonographically. | IP.3.A.2. |
| 45. Verify completeness of study according to facility's protocol. | IP.3.A. |
| 46. Answer questions about additional imaging studies. | PC.1.B.3.C. |



Content Categories

Legend: PC = Patient Care,
IP = Image Production,
P = Procedures

Activity

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- | | |
|---|-------------|
| 47. Use teleradiology or PACS. | IP.3.B. |
| 48. Verify vascular procedure coding. | PC.1.A.2.A. |
| 49. Review pertinent patient information and vascular studies with the interpreting physician(s). | IP.3.A. |

Following clinical protocols, position patient and transducer using appropriate technical factors to produce diagnostic vascular studies and recognize pathology of:

ABDOMINAL / PELVIC VASCULATURE

Arterial

- | | |
|-------------------------|----------|
| 50. aorta | P.1.A.1. |
| 51. celiac | P.1.A.2. |
| 52. hepatic | P.1.A.3. |
| 53. splenic | P.1.A.4. |
| 54. superior mesenteric | P.1.A.5. |
| 55. inferior mesenteric | P.1.A.5. |
| 56. renal | P.1.A.6. |
| 57. common iliac | P.1.A.7. |
| 58. internal iliac | P.1.A.8. |
| 59. external iliac | P.1.A.9. |

Venous

- | | |
|-------------------------|-----------|
| 60. inferior vena cava | P.1.B.1. |
| 61. hepatic | P.1.B.2. |
| 62. portal | P.1.B.3. |
| 63. splenic | P.1.B.4. |
| 64. superior mesenteric | P.1.B.5. |
| 65. renal | P.1.B.6. |
| 66. pelvic congestion | P.1.B.7. |
| 67. common iliac | P.1.B.8. |
| 68. internal iliac | P.1.B.9. |
| 69. external iliac | P.1.B.10. |

TRANSPLANT VASCULATURE

- | | |
|------------|----------|
| 70. liver | P.1.C.1. |
| 71. kidney | P.1.C.2. |



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Activity

ARTERIAL PERIPHERAL VASCULATURE

Upper Extremity

| | | |
|-----|------------------------------------|----------|
| 72. | brachiocephalic | P.2.A.1. |
| 73. | subclavian | P.2.A.2. |
| 74. | axillary | P.2.A.3. |
| 75. | brachial | P.2.A.4. |
| 76. | radial | P.2.A.5. |
| 77. | ulnar | P.2.A.6. |
| 78. | digital | P.2.A.7. |
| 79. | palmar arch (including Allen test) | P.2.A.7. |

Lower Extremity

| | | |
|-----|---------------------|-----------|
| 80. | external iliac | P.2.B.1. |
| 81. | common femoral | P.2.B.2. |
| 82. | superficial femoral | P.2.B.3. |
| 83. | deep femoral | P.2.B.4. |
| 84. | popliteal | P.2.B.5. |
| 85. | tibioperoneal trunk | P.2.B.6. |
| 86. | posterior tibial | P.2.B.7. |
| 87. | anterior tibial | P.2.B.8. |
| 88. | peroneal | P.2.B.9. |
| 89. | dorsalis pedis | P.2.B.10. |

VENOUS PERIPHERAL VASCULATURE

Upper Extremity

| | | |
|-----|------------------|----------|
| 90. | internal jugular | P.3.A.1. |
| 91. | brachiocephalic | P.3.A.2. |
| 92. | subclavian | P.3.A.3. |
| 93. | axillary | P.3.A.4. |
| 94. | brachial | P.3.A.5. |
| 95. | cephalic | P.3.A.6. |
| 96. | basilic | P.3.A.7. |
| 97. | radial | P.3.A.8. |
| 98. | ulnar | P.3.A.9. |
| 99. | vein mapping | P.3.C.1. |



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| Lower Extremity | | |
|---|---|-------------------|
| 100. | external iliac | P.3.B.1. |
| 101. | common femoral | P.3.B.2. |
| 102. | femoral | P.3.B.3. |
| 103. | deep femoral | P.3.B.4. |
| 104. | popliteal | P.3.B.5. |
| 105. | great saphenous | P.3.B.6. |
| 106. | small saphenous | P.3.B.7. |
| 107. | calf veins | P.3.B.8. |
| 108. | vein mapping | P.3.C.1. |
| 109. | reflux assessment (e.g., venous insufficiency, perforators, varicose veins, valve competency) | P.3.C.2. |
| EXTRACRANIAL CEREBRAL VASCULATURE | | |
| 110. | carotid artery (CCA, ICA, ECA) | P.4.A. |
| 111. | vertebral artery | P.4.B. |
| 112. | subclavian artery | P.2.A.2. |
| Following clinical protocols, position patient and transducer using appropriate technical factors to produce diagnostic images: | | |
| STRESS/PRESSURE TESTING | | |
| 113. | pulse volume recording (PVR) | P.2.C.1. |
| 114. | segmental pressures – upper extremities | P.2.C.2., IP.1.C. |
| 115. | segmental pressures – lower extremities | P.2.C.3., IP.1.C. |
| 116. | ankle-brachial index (ABI) | P.2.C.4., IP.1.C. |
| 117. | post-exercise testing | P.2.C.5., IP.1.C. |
| 118. | photoplethysmography (PPG) | P.2.C.6. |
| 119. | toe-brachial index (TBI) | P.2.C.7. |
| POST INTERVENTION | | |
| 120. | bypass grafts | P.4.C.1. |
| 121. | endografts | P.4.C.2. |
| 122. | dialysis access grafts/fistulae | P.4.C.3. |
| 123. | stents | P.4.C.4. |
| 124. | post catheterization complications | P.4.C.5. |
| 125. | IVC filters | P.4.C.6. |



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Activity

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|------|---------------------|----------|
| 126. | TIPS | P.4.C.7. |
| 127. | line position | P.4.C.8. |
| 128. | post endarterectomy | P.4.C.9. |

Assist with the following sonographic interventional procedures:

INTERVENTIONAL

- | | | |
|------|---|--------------------|
| 129. | vein ablations | PC.1.G., P.4.C.10. |
| 130. | pseudoaneurysm treatment - compression or guided thrombin injection | PC.1.G., P.4.C.11. |