



Vascular Interventional Radiography

Certification and registration requirements for vascular interventional radiography are based on the results of a comprehensive practice analysis conducted by The American Registry of Radiologic Technologists (ARRT) staff and the Vascular Interventional Radiography Practice Analysis Committee. The purpose of the practice analysis is to identify job responsibilities typically required of vascular interventional radiographers at entry into the profession. The results of the practice analysis are reflected in this document. The attached task inventory is the foundation for the clinical experience requirements and the content outline which, in turn, is the foundation for the content specifications and the CQR SSA content specifications.

Basis of Task Inventory

In 2021, the ARRT surveyed a large, national sample of vascular interventional radiographers to identify their responsibilities. When evaluating survey results, the committee applied a 40% criterion. That is, to be included on the task inventory, an activity must have been performed by at least 40% of vascular interventional radiographers. The 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% criterion but is expected to rise above the 40% criterion in the near future).

Application to Clinical Experience Requirements

The purpose of the clinical experience requirements is to document that candidates have performed a subset of the clinical procedures within a discipline. Successful performance of these fundamental procedures, in combination with mastery of the cognitive knowledge and skills as documented by the examination requirement, 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 experience requirements. If an activity is designated as a mandatory requirement, survey results had to indicate that vascular interventional radiographers performed that activity. The committee may designate clinical activities performed by fewer vascular interventional radiographers, or which are carried out only in selected settings, as elective. The *Vascular Interventional Radiography Clinical Experience Requirements* are available from ARRT's website (www.arrt.org).

Application to Content Specifications

The purpose of the examination requirements is to assess whether individuals have obtained the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required in vascular interventional radiography for practice at entry level. 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 *Vascular Interventional Radiography Content Specifications* are available from ARRT's website (www.arrt.org).

* 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.



Content Categories

PC = Patient Care
IP = Image Production
P = Procedures
FOQ = Focus of Questions

Activity	
1. Verify package integrity and expiration date of sterile supplies.	PC.1.F.
2. Verify the type, concentration, amount, and expiration date of medications.	PC.1.E.
3. Check emergency cart to ensure appropriate emergency supplies.	PC.1.C.2., PC.1.H.
4. Prepare equipment or trays with medications and supplies.	PC.1.F.1.
5. Prepare equipment for sterilization.	PC.1.F.1.
6. Clean and disinfect or sterilize facilities and equipment.	PC.1.F.1.
7. Ensure proper function and cleanliness of the automatic contrast injector.	IP.1.B.
8. Evaluate sequencing of imaging procedures and inform physician of concerns (e.g., NPO status, contrast administration).	PC.1.B.3.
9. Address the patient's ability to tolerate the requested procedure (e.g., physical, sensory, or cognitive impairments).	PC.1.A.1.
10. Obtain pertinent medical history (e.g., clinical notes, labs, prior imaging, allergies).	PC.1.B.1.
11. Confirm the patient's preparation (e.g., diet restrictions, preparatory medications) prior to procedure.	PC.1.B.4.
12. Communicate with the patient, patient's family, or authorized representative regarding scheduling delays, exam duration, and additional imaging procedures.	PC.1.A., PC.1.B.
13. Verify presence of appropriate signed informed procedural consent.	PC.1.B.5.
14. Recognize abnormal or missing lab values relative to the procedure ordered.	PC.1.B.8.
15. Prior to administration of a contrast agent or medication, determine if the patient is at risk for an adverse event.	PC.1.E.4., PC.1.D.2.
16. Obtain baseline vital signs, monitor changes, and recognize abnormalities.	PC.1.C.1., PC.1.C.2.
17. Observe ECG for changes and recognize abnormal rhythms.	PC.1.C.1.B.
18. Assess distal pulses pre- and postprocedure.	PC.1.B.7.B.
19. Participate in preprocedural time-out activity.	PC.1.A.1.C.
20. Prepare and drape the access site(s).	PC.1.F.1.B.1.
21. Explain the procedure instructions to the patient, patient's family, or authorized representative (e.g., preprocedure, postprocedure).	PC.1.A.1.A.
22. Prepare the patient for the examination to include physiological monitoring equipment.	PC.1.C.



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Activity

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|-----|---|----------------------|
| 23. | In conjunction with the physician, select the appropriate contrast agent: | PC.1.D. |
| a. | ionic | PC.1.D.1.A. |
| b. | nonionic low osmolar | PC.1.D.1.B. |
| c. | nonionic iso-osmolar | PC.1.D.1.C. |
| d. | CO ₂ | PC.1.D.1.D. |
| e. | gadolinium | PC.1.D.1.E. |
| 24. | Set up and operate the automatic contrast injector. | IP.1.B. |
| 25. | Prepare or assist in administering the following types of injectable medications according to physician's orders: | PC.1.E. |
| a. | anticoagulants | PC.1.E.1.A. |
| b. | thrombolytics | PC.1.E.1.B. |
| c. | vasoactives (e.g., constrictors, dilators) | PC.1.E.1.C. |
| 26. | Recognize and communicate the need for prompt medical attention. | PC.1.H., PC.1.C.1. |
| 27. | Recognize the need for, and administer, emergency care. | PC.1.H. |
| 28. | Monitor and maintain medical equipment (e.g., IVs, oxygen) used during the procedure. | PC.1.C.2. |
| 29. | Identify characteristics of interventional and diagnostic nonimaging equipment (e.g., balloons, wires, appropriate sizing). | P.1-3. FOQ |
| 30. | Use sterile or aseptic technique when indicated. | PC.1.F. |
| 31. | Follow environmental protection standards for handling and disposing of biohazardous materials (e.g., sharps, blood, body fluids). | PC.1.G. |
| 32. | Handle, label, and submit laboratory specimens (e.g., body fluid, tissue samples). | PC.1.G.2. |
| 33. | Adjust and calibrate pressure transducers. | IP.1.C.9. |
| 34. | Scrub in to assist with procedure. | PC.1.F.4. |
| 35. | Take appropriate precautions to minimize radiation exposure to the patient. | IP.1.D.1. |
| 36. | Take appropriate precautions to minimize occupational radiation exposure. | IP.1.D.2. |
| 37. | Advocate radiation safety and protection. | PC.1.A.1.B., IP.1.D. |
| 38. | Describe the potential risk of radiation exposure when asked. | IP.1.D.2.D. |
| 39. | Wear a radiation monitoring device while on duty. | IP.1.D.2.B. |
| 40. | Position the patient and/or imaging equipment to achieve desired projections. | IP.1.A.3. |
| 41. | Select appropriate imaging protocols (e.g., frame rates, high/low level fluoroscopy) to optimize image quality while minimizing dose. | IP.1.A. |



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42. Employ image enhancement techniques (e.g., magnification, filtration, collimation) during procedure to improve image quality.	IP.1.A.
43. Initiate the radiographic exposure.	IP.1.A.
44. Monitor procedure dose metrics against the substantial radiation dose level (NRCP report #168).	IP.1.D.4.
45. Document and assess accuracy of dose metrics for patient exams per compliance regulations.	PC.1.C.3.
46. Adjust digital images (e.g., roadmapping, subtraction, magnification).	IP.1.A.1., IP.1.A.2.
47. Postprocess images (e.g., 3D reconstruction, annotation).	IP.1.A.4., IP.1.A.5.
48. Assist with ultrasound guidance.	P.1-3. FOQ
49. Assist in hybrid OR procedures.	P.1-2. FOQ
50. Operate interventional procedural equipment: a. ultrasound units b. intravascular ultrasound (IVUS) c. cryo/microwave ablation d. thrombectomy e. thrombolysis f. atherectomy g. laser h. lithotripsy (balloon or catheter)	IP.1.C. IP.1.C.1. IP.1.C.2. IP.1.C.3. IP.1.C.4. IP.1.C.5. IP.1.C.6. IP.1.C.7. IP.1.C.8.
51. Monitor and record all procedural data (e.g., injection data, physiologic data, administered medications, complications).	PC.1.C.3.
52. Evaluate individual occupational exposure reports to determine if values for the reporting period are within established limits.	IP.1.D.2.C.

Assist with the following procedures:

Vascular Access Assessment

53. Arterial access	PC.1.B.7. P.1-2. FOQ
54. Venous access	PC.1.B.7. P.1-2. FOQ
55. Vascular patency (e.g., ultrasound, Allen test)	PC.1.B.7.A.

Vascular Diagnostic Procedures

56. Intracranial arteriography	P.1.A.1.
57. Carotid/vertebral arteriography	P.1.A.2.
58. Spinal arteriography	P.1.A.3.
59. Thoracic aortography	P.1.B.1.



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60. Pulmonary arteriography	P.1.B.2.
61. Bronchial arteriography	P.1.B.3.
62. Abdominal aortography	P.1.C.1.
63. Pelvic arteriography	P.1.C.2.
64. Renal arteriography	P.1.C.3.
65. Adrenal arteriography	P.1.C.4.
66. Celiac arteriography	P.1.C.5.
67. Superior mesenteric artery (SMA)	P.1.C.6.
68. Inferior mesenteric artery (IMA)	P.1.C.7.
69. Upper extremity arteriogram	P.1.D.1.
70. Lower extremity arteriogram	P.1.D.2.
71. Pelvic venography	P.1.E.1.
72. Superior vena cavagram	P.1.E.2.
73. Inferior vena cavagram	P.1.E.3.
74. Renal venography	P.1.E.4.
75. Adrenal venography	P.1.E.5.
76. Gonadal venography	P.1.E.6.
77. Hepatic venography	P.1.E.7.
78. Portal venography	P.1.E.8.
79. Upper extremity venogram	P.1.E.9.
80. Lower extremity venogram	P.1.E.10.
81. Venous sampling	P.1.E.11.
82. Hemodialysis graft/fistula study	P.1.F.1.
83. Lymphangiography (general mapping)	P.1.F.2.
84. Physiological pressure measurement	P.1.F.3.
85. Central venous device check (e.g., port, PICC, hemodialysis catheter)	P.1.F.4.

Vascular Interventional Procedures

86. Angioplasty:	P.2.A.
a. neurologic	P.2.A.1.
b. body	P.2.A.2.
87. Stent placement:	P.2.B.
a. neurologic	P.2.B.1.
b. body	P.2.B.2.



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88.	Embolization:	P.2.C.
	a. neurologic	P.2.C.1.
	b. body	P.2.C.2.
89.	Thrombolysis:	P.2.D.
	a. neurologic	P.2.D.1.
	b. body	P.2.D.2.
90.	Thrombectomy:	P.2.E.
	a. neurologic	P.2.E.1.
	b. body	P.2.E.2.
91.	Atherectomy	P.2.F.
92.	Percutaneous thrombin injection	P.2.G.
93.	Distal protection device placement	P.2.H.
94.	Foreign body retrieval	P.2.I.
95.	Endograft placement	P.2.J.
96.	Caval filter placement	P.2.K.
97.	Caval filter removal	P.2.K.
98.	Transjugular intrahepatic portosystemic shunt (TIPS) placement or revision	P.2.L.
99.	Transvenous biopsy	P.2.M.
100.	Chemoembolization	P.2.N.
101.	Radioembolization	P.2.O.
102.	Venous Access	P.2.P.
103.	Tunneled catheter	P.2.P.1.
104.	Nontunneled catheter	P.2.P.2.
	a. port placement	P.2.P.3.
	b. port removal	P.2.P.4.
	c. PICC line placement	P.2.P.5.

Nonvascular Procedures

105.	Nephrostomy	P.3.A.
106.	Ureteral dilatation/stents	P.3.B.
107.	Antegrade urography through an existing catheter	P.3.C.
108.	Suprapubic catheter placement	P.3.D.
109.	Percutaneous ablation (e.g., radiofrequency [RFA], thermal, cryoablation)	P.3.E.



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110. Percutaneous transhepatic cholangiogram	P.3.F.
111. Biliary internal/external drainage	P.3.G.
112. Cholecystostomy	P.3.H.
113. Gastrostomy/gastrojejunostomy	P.3.I.
114. Percutaneous enteric tube evaluation (verification with contrast)	P.3.J.
115. Vertebroplasty/kyphoplasty	P.3.K.
116. Epidural steroid injection	P.3.L.
117. Lumbar puncture	P.3.M.
118. Myelogram	P.3.N.
119. Chest tube/drain placement	P.3.O.
120. Thoracentesis	P.3.P.
121. Percutaneous biopsy	P.3.Q.
122. Paracentesis	P.3.R.
123. Abscess, fistula, or sinus tract study	P.3.S.
124. Tunneled drainage catheter placement	P.3.T.
a. thoracic	P.3.T.1.
b. abdominal	P.3.T.2.
125. Percutaneous drainage with or without placement of catheter (excluding thoracentesis and paracentesis)	P.3.U.
126. Removal of percutaneous drainage catheter (e.g., tunneled, nontunneled)	P.3.V.
127. Change of percutaneous tube or drainage catheter	P.3.W.

Postprocedure Patient Care

128. Vascular closure device placement:	P.1-2. FOQ
a. permanent	P.1-2. FOQ
b. nonpermanent	P.1-2. FOQ
129. Apply pressure to arterial or venous puncture site:	P.1-2. FOQ
a. manual pressure	P.1-2. FOQ
b. external device	P.1-2. FOQ
130. Apply dressing (e.g., surgical glue, hemostatic dressing, external fixation).	P.1-2. FOQ
131. Assist with access site complication management.	P.1-3. FOQ