



# Vascular-Interventional Radiography

Certification and registration requirements for vascular-interventional (VI) 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 and Continuing Qualifications Requirements (CQR) Advisory Committee. The purpose of the practice analysis is to identify job responsibilities typically required of VI radiographers at entry into the profession. The results of the practice analysis are reflected in this document. The purpose of the task inventory is to list or delineate those responsibilities. The task inventory is the foundation for both the clinical experience requirements and the content specifications.

## Basis of Task Inventory

In 2016, the ARRT surveyed a large, national sample of VI radiographers to identify their responsibilities. 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 VI radiographers. 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 Experience Requirements

The purpose of the clinical experience requirements is to verify that candidates have completed a subset of the clinical procedures within VI radiography. Successful performance of these fundamental procedures, in combination with mastery of the cognitive knowledge and skills covered by the VI radiography 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 experience requirements. For an activity to be designated as a mandatory requirement, survey results had to indicate the vast majority of VI radiographers performed that activity. The advisory committee designated clinical activities performed by fewer VI radiographers, or which are carried out only in selected settings, as elective. The clinical experience requirements are available from ARRT's website ([www.arrt.org](http://www.arrt.org)) and appear in the *Vascular-Interventional Radiography Certification and Registration Handbook* also located on the ARRT website.

## Application to Content Specifications

The purpose of the ARRT VI Radiography Examination is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of VI radiographers 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 from ARRT's website ([www.arrt.org](http://www.arrt.org)) and appear in the *Vascular-Interventional Radiography Certification and Registration Handbook*.



Activity	Content Categories
Legend: PC = Patient Care, IP = Image Production, P = Procedures	
1. Verify package integrity and expiration date of sterile supplies.	PC.1.E.1.B., P.1.–P.3.
2. Verify the type, concentration, amount, and expiration date of medications.	PC.1.B.5.B.
3. Prepare equipment or trays with medications.	PC.1.D.1.–D.3., PC.1.E.1.B., P.1.–P.3.
4. Prepare equipment for sterilization.	PC.1.E.1.B.
5. Ensure proper function and cleanliness of the automatic contrast injector.	PC.1.E.1.A., IP.1.B.
6. Verify presence of appropriate signed informed procedural consent.	PC.1.A.1.B.
7. Verify patient's identification.	PC.1.A.1.
8. Identify allergies and history of contrast reaction prior to any procedure, using patient records and by questioning patient.	PC.1.A.1., PC.1.C.2., PC.1.G.1.–G.2.
9. Monitor and record vital signs.	PC.1.B.1., PC.1.B.5.E.
10. Assess distal pulses pre and post procedure.	PC.1.B.2.
11. Participate in pre-procedural time-out activity.	PC.1.A.1.D.
12. Prepare the access site(s) to include the required sterile drapes and covers.	PC.1.B.2., PC.1.E.1.B.
13. Provide for patient comfort and cooperation by familiarizing patient with the equipment and the examination.	PC.1.A.
14. Prepare the patient for the examination to include physiological monitoring equipment.	PC.1.B.
<b>In conjunction with physician, select the appropriate contrast agent:</b>	
15. Ionic	PC.1.C.1.A.
16. Nonionic low osmolar	PC.1.C.1.B.
17. Nonionic iso-osmolar	PC.1.C.1.C.
18. CO <sub>2</sub>	PC.1.C.1.D.
19. Gadolinium	PC.1.C.1.E.
20. Set-up and operate the automatic contrast injector.	IP.1.B.
<b>Prepare or assist in administering (e.g., obtain medication, fill syringe) the following types of injectable medications according to physician's orders:</b>	
21. Analgesics	PC.1.D.1.
22. Anticoagulants	PC.1.D.1.
23. Thrombolytics	PC.1.D.1.
24. Vasoactives (constrictors, dilators)	PC.1.D.1.
25. Recognize patient emergencies (e.g., seizure, cardiac distress).	PC.1.G.



Activity	Content Categories
26. Respond to patient emergencies (e.g., CPR, defibrillation).	PC.1.G.
27. Monitor and maintain medical equipment (e.g., IVs, oxygen) used during the procedure.	PC.1.B.4.
28. Use sterile or aseptic technique as required to help prevent infection.	PC.1.E.
29. Handle blood and body fluids in a manner appropriate to biohazardous materials.	PC.1.F.
30. Adjust and calibrate pressure transducers.	PC.1.B.1.E., P.1.F.2.
31. Scrub with the physician.	PC.1.E.1., P.1.–P.2.–6. P.3–5.,
32. Take appropriate precautions to minimize radiation exposure to the patient.	IP.1.C.1.
33. Take appropriate precautions to minimize occupational radiation exposure.	IP.1.C.2.
34. Advocate radiation safety and protection.	IP.1.C.
35. Describe the potential risk of radiation exposure when asked.	PC.1.A.1.C., IP.1.C.
36. Wear a personnel monitoring device while on duty.	IP.1.C.2.B.
37. Position the patient and/or imaging equipment to achieve desired projections.	IP.1.A.3., P.–4.
38. Select appropriate imaging protocols (e.g., frame rates, high/low level fluoro) to optimize image quality while minimizing dose.	IP.1.A.1.A.1.–A.2., IP.1.C.1.
39. Employ image-enhancement techniques (e.g., magnification, filtration, collimation) during procedure to improve image quality.	IP.1.A.1.A.1.–A.2.
40. Acquire digital images.	IP.1.A.1.A.
41. Document fluoroscopy time.	PC.1.B.5.C.
42. Document total radiation dose.	PC.1.B.5.D.
43. Process digital images (e.g., roadmapping, subtraction, annotation, magnification).	IP.1.A.1.A.
44. Process images: 3D reconstruction.	IP.1.A.1.A.2.F.
45. Assist with ultrasound guidance for vascular access or organ access/biopsy.	P.–7.
46. Monitor and record all procedural data. (e.g., injection data, physiologic data, administered medications, complications).	PC.1.B.5.
47. Evaluate individual occupational exposure reports to determine if values for the reporting period are within established limits.	IP.1.C.2.C.
<b>Assist with the following procedures:</b>	
<b><u>Vascular Access Assessment</u></b>	
48. Arterial access	PC.1.B.2.
49. Venous access	PC.1.B.2.



Activity	Content Categories
50. Vascular patency (e.g., ultrasound, Allen test)	PC.1.B.2.A.
<b><u>Vascular Diagnostic Procedures</u></b>	
51. Intracranial arteriography	P.1.A.1.
52. Extracranial arteriography	P.1.A.2.
53. Spinal arteriography	P.1.A.3.
54. Thoracic aortography	P.1.B.1.
55. Pulmonary arteriography	P.1.B.2.
56. Bronchial arteriography	P.1.B.3.
57. Abdominal aortography	P.1.C.1.
58. Pelvic arteriography	P.1.C.2.
59. Renal arteriography	P.1.C.3.
60. Adrenal arteriography	P.1.C.4.
61. Celiac arteriography	P.1.C.5.
62. Superior mesenteric artery (SMA)	P.1.C.6.
63. Inferior mesenteric artery (IMA)	P.1.C.7.
64. Upper extremity arteriogram	P.1.D.1.
65. Lower extremity arteriogram	P.1.D.2.
66. Pelvic venography	P.1.E.1.
67. Superior vena cavagram	P.1.E.2.
68. Inferior vena cavagram	P.1.E.3.
69. Renal venography	P.1.E.4.
70. Adrenal venography	P.1.E.5.
71. Gonadal venography	P.1.E.6.
72. Hepatic venography	P.1.E.7.
73. Portal venography	P.1.E.8.
74. Upper extremity venogram	P.1.E.9.
75. Lower extremity venogram	P.1.E.10.
76. Venous sampling	P.1.E.11.
77. Hemodialysis graft/fistula study	P.1.F.1.
78. Physiological pressure measurement	P.1.F.2.
79. Central venous device check (e.g., port, PICC, hemodialysis catheter)	P.1.F.3.
<b><u>Vascular Interventional Procedures</u></b>	
Angioplasty	



<b>Activity</b>		<b>Content Categories</b>
80.	Neurologic	P.2.A.1.
81.	Body Stent placement	P.2.A.2.
82.	Neurologic	P.2.B.1.
83.	Body Embolization	P.2.B.2.
84.	Neurologic	P.2.C.1.
85.	Body Thrombolysis /Thrombectomy	P.2.C.2.
86.	Neurologic	P.2.D.1.
87.	Body	P.2.D.2.
88.	Atherectomy	P.2.E.
89.	Distal protection device placement	P.2.F.
90.	Foreign body retrieval	P.2.G.
91.	Endograft placement	P.2.H.
92.	Caval filter placement	P.2.I.
93.	Caval filter removal	P.2.I.
94.	Transjugular intrahepatic portosystemic shunt (TIPS) placement or revision	P.2.J.
95.	Transvenous biopsy	P.2.K.
96.	Chemoembolization	P.2.L.
97.	Radioembolization	P.2.M.
	<b>Venous Access</b>	
98.	Tunneled catheter	P.2.N.1.
99.	Non-tunneled catheter	P.2.N.2.
100.	Port	P.2.N.3.
101.	Peripheral IV	P.2.N.4.
	<b><u>Nonvascular Procedures</u></b>	
102.	Nephrostomy	P.3.A.
103.	Ureteral dilatation/stents	P.3.B.
104.	Percutaneous stone extraction (e.g., renal, biliary)	P.3.C.
105.	Drainage procedures	P.3.D.
106.	Percutaneous radiofrequency ablation (RFA)	P.3.E.



<b>Activity</b>		<b>Content Categories</b>
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107.	Percutaneous transhepatic cholangiogram	P.3.F.
108.	Biliary internal/external drainage	P.3.G.
109.	Cholecystostomy	P.3.H.
110.	Gastrostomy/gastrojejunostomy	P.3.I.
111.	Vertebroplasty/kyphoplasty	P.3.J.
112.	Discography	P.3.K.
113.	Chest tube/drain placement	P.3.L.
114.	Thoracentesis	P.3.M.
115.	Percutaneous biopsy	P.3.N.
116.	Paracentesis	P.3.O.
	Tunneled drainage catheter placement	
117.	Thoracic	P.3.P.1.
118.	Abdominal	P.3.P.2.
	<b>Post-Procedure Patient Care</b>	
119.	Vascular closure device placement	PC.1.E.1., P.1.A.~5., P.1.B.~5.
120.	Apply pressure to arterial or venous puncture site	PC.1.E.1., P.1.A.~5., P.1.B.~5.
121.	Apply dressing to puncture.	PC.1.E.1., P.1.A.~5., P.1.B.~5.