



The Vascular-Interventional Radiography Examination

The purpose of The American Registry of Radiologic Technologists® (ARRT®) Vascular-Interventional Radiography Examination is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of the technologists who perform vascular-interventional radiography. Using a nationwide survey, the ARRT periodically conducts a practice analysis to develop a task inventory which delineates or lists the job responsibilities typically required of staff vascular-interventional technologists.¹ An advisory committee then determines the knowledge and cognitive skills needed to perform the tasks on the task inventory and these are organized into the content categories within this document. The document is used to develop the examination. The results of the most recent practice analysis have been applied to this document. Every content category can be linked to one or more activities on the task inventory. The complete [task inventory](#) is available at arrt.org.

The following table presents the major content categories and subcategories covered on the examination, and indicates the number of test questions in each category. The remaining pages list the specific topics addressed within each category, with the approximate number of test questions allocated to each topic appearing in parentheses.

This document is not intended to serve as a curriculum guide. Although certification and registration programs and educational programs may have related purposes, their functions are clearly different. Educational programs are generally broader in scope and address the subject matter that is included in these content specifications, but do not limit themselves to only this content.

1. A special debt of gratitude is due to the hundreds of professionals participating in this project as committee members, survey respondents and reviewers.



Content Category	Number of Scored Questions ¹
A. Equipment and Instrumentation	24
B. Patient Care	28
C. Vascular-Interventional Procedures	
1. Neurologic	16
2. Thoracic	12
3. Abdominal	25
4. GU and GI Nonvascular	15
5. Peripheral	20
6. Dialysis Management	11
7. Venous Access	9
Total	160

1. Each exam includes an additional 50 unscored (pilot) questions.



A. Equipment and Instrumentation (24)

I. Digital Imaging (6)

- A. Image Characteristics
 - 1. pixel
 - 2. image matrix
 - 3. dynamic range
- B. Image Production
 - 1. data acquisition
 - 2. post-processing
 - 3. subtraction technique
 - 4. archiving
 - 5. quality control
 - 6. display
 - 7. 3D reconstruction

2. Automatic Pressure Injectors (3)

- A. Parts
- B. Function
- C. Operation

3. Procedural Supplies (10)

- A. Types
 - 1. diagnostic (e.g.,* catheters, guidewires, needles, sheaths)
 - 2. interventional (e.g., balloon, cutting balloon, atherectomy device, mechanical thrombectomy devices)
 - 3. closure devices
- B. Construction
- C. Indications for Use

4. Implantable Devices (5)

- A. Caval Filters (permanent and removable)
- B. Central Venous Catheters (with or without subcutaneous port)
- C. Embolic Materials
- D. Stents
 - 1. vascular
 - 2. non-vascular
- E. Stent Grafts

B. Patient Care (28)

I. Patient Communication (2)

- A. Patient Education
- B. Informed Consent
- C. Pre-Procedural Time-Out

2. Patient Assessment and Monitoring (7)

(normal and abnormal values; implications)

- A. Physiologic Monitoring
 - 1. vital signs
 - 2. ECG
 - a. equipment and patient preparation
 - b. interpretation (sinus rhythm, common arrhythmias)
 - 3. pulse oximetry
- B. Access Assessment
 - 1. peripheral pulses
 - 2. anatomical location
- C. Lab Values
 - 1. renal function (e.g., BUN, creatinine, eGFR)
 - 2. blood coagulation (e.g., PT, PTT, INR, ACT)
 - 3. hematology (e.g., Hgb, WBC, platelet)
 - 4. other (e.g., LFT, potassium)

- D. Maintaining Accessory Medical Devices
 - 1. oxygen delivery systems
 - 2. chest tubes
 - 3. in-dwelling catheters
 - 4. drainage bags

3. Contrast Administration (3)

- A. Types and Properties of Contrast Agents
 - 1. ionic
 - 2. nonionic
 - a. low-osmolar
 - b. iso-osmolar
 - 3. CO₂
- B. Indications and Contraindications

*e.g., This is used here and in the remainder of this document to indicate examples of the topics covered, but not a complete list.

(Section B continues on the following page.)



B. Patient Care (continued)

4. Medications (6)

- A. Types and Administration Routes
 - 1. analgesics (e.g., fentanyl)
 - 2. IV sedatives (e.g., diazepam, midazolam)
 - 3. anticoagulants
 - 4. thrombolytics
 - 5. vasoconstrictors
 - 6. vasodilators
- B. Indications and Contraindications
- C. Preparation and Dosage
- D. Complications

5. Asepsis and Sterile Technique (3)

- A. Sterile Technique
 - 1. sterile fields
 - a. patient preparation
 - b. procedural tray
 - c. maintenance of sterile fields
 - 2. surgical scrub technique
- B. Infection Control
 - 1. CDC Standard Precautions
 - 2. transmission-based precaution
 - a. contact
 - b. airborne
 - c. droplet

6. Emergency Care (5)

- A. Contrast Reactions and Complications
 - 1. allergic-type
 - a. minor
 - b. intermediate
 - c. severe
 - 2. adverse
 - a. hemodynamic responses
 - b. nephrotoxicity
 - c. CNS reactions
- B. Treatment and Medications
 - 1. types (e.g., steroids, antihistamines)
 - 2. indications and contraindications
- C. Symptoms and Treatment of Medical Emergencies
 - 1. air embolism
 - 2. anaphylaxis
 - 3. bleeding
 - 4. cardiac arrhythmias
 - 5. congestive heart failure
 - 6. hemothorax
 - 7. hypertensive episodes
 - 8. hypotensive episodes
 - 9. myocardial infarction
 - 10. pneumothorax
 - 11. respiratory arrest
 - 12. sepsis
 - 13. thrombosis
 - 14. thrombotic embolism
 - 15. TIA
 - 16. vasovagal response

7. Cardiac Life Support (2)

- A. BLS
- B. Defibrillation



C. Vascular-Interventional Procedures (108)

CATEGORY

1. Neurologic (16)

- A. Angiography (9)
 - 1. cerebral
 - 2. carotid
 - 3. spinal
- B. Interventional Procedures (7)
 - 1. embolization
 - 2. thrombolysis
 - 3. thrombectomy
 - 4. angioplasty
 - 5. stent placement
 - 6. distal protection device placement
 - 7. foreign body retrieval
 - 8. vertebroplasty
 - 9. kyphoplasty
 - 10. discography

2. Thoracic (12)

- A. Angiography (7)
 - 1. aortography
 - 2. pulmonary
 - 3. bronchial
 - 4. superior vena cava
- B. Interventional Procedures (5)
 - 1. embolization
 - 2. thrombolysis
 - 3. thrombectomy
 - 4. angioplasty
 - 5. stent placement
 - 6. biopsy
 - 7. drainage procedures
 - 8. foreign body retrieval
 - 9. thermal ablation
 - 10. chest tube placement
 - 11. thoracentesis
 - 12. endograft placement

FOCUS OF QUESTIONS

Questions for each section of the exam may address any of the following factors, as appropriate:

- 1. Anatomy and Physiology
- 2. Pathology
- 3. Indications for Procedure
- 4. Contraindications for Procedure
- 5. Patient Positioning
- 6. Access Method
- 7. Ultrasound Guidance
- 8. Patient Management
- 9. Intravascular Pressure Measurements
- 10. Contrast Administration (i.e., ionic, nonionic, CO₂)
- 11. Equipment (e.g., imaging media, automatic injectors)
- 12. Exposure Technique
- 13. Image Enhancement
- 14. Closure Devices
- 15. Complications

(Section C continues on the following page.)



C. Vascular-Interventional Procedures (continued)

CATEGORY

3. Abdominal (25)

A. Arteriography (11)

1. abdominal aortography
2. pelvic
3. renal
4. adrenal
5. reproductive
6. celiac
7. SMA
8. IMA

B. Venography (6)

1. pelvic
2. inferior vena cava
3. renal
4. adrenal
5. gonadal
6. venous sampling
7. hepatic
8. portal
 - a. splenic
 - b. SMV
 - c. IMV

C. Interventional Procedures (8)

1. caval filter placement
2. caval filter removal
3. endograft placement
4. paracentesis
5. thrombolysis
6. thrombectomy
7. angioplasty
8. stent placement
9. foreign body retrieval
10. TIPS
11. chemoembolization
12. radioembolization
13. embolization (other)

FOCUS OF QUESTIONS

Questions for each section of the exam may address any of the following factors, as appropriate:

1. Anatomy and Physiology
2. Pathology
3. Indications for Procedure
4. Contraindications for Procedure
5. Patient Positioning
6. Access Method
7. Ultrasound Guidance
8. Patient Management
9. Intravascular Pressure Measurements
10. Contrast Administration (i.e., ionic, nonionic, CO₂)
11. Equipment (e.g., imaging media, automatic injectors)
12. Exposure Technique
13. Image Enhancement
14. Closure Devices
15. Complications

(Section C continues on the following page.)



C. Vascular-Interventional Procedures (continued)

CATEGORY

FOCUS OF QUESTIONS

4. GU and GI Nonvascular (15)

- A. GU Interventional Procedures (7)
 - 1. nephrostomy
 - 2. ureteral dilation/stents
 - 3. percutaneous renal stone extraction
 - 4. drainage procedures
 - 5. thermal ablation
- B. GI Interventional Procedures (8)
 - 1. biliary stone extraction
 - 2. percutaneous transhepatic cholangiogram
 - 3. biliary drainage/stenting
 - 4. cholecystostomy
 - 5. gastrostomy/gastrojejunostomy
 - 6. drainage procedures
 - 7. biopsy (percutaneous or transvascular)
 - 8. thermal ablation

5. Peripheral (20)

- A. Arteriography (9)
 - 1. upper extremity
 - 2. lower extremity
- B. Venography (2)
 - 1. upper extremity
 - 2. lower extremity
- C. Interventional Procedures (9)
 - 1. embolization
 - 2. thrombolysis
 - 3. thrombectomy
 - 4. angioplasty
 - 5. stent placement
 - 6. atherectomy
 - 7. foreign body retrieval

Questions for each section of the exam may address any of the following factors, as appropriate:

- 1. Anatomy and Physiology
- 2. Pathology
- 3. Indications for Procedure
- 4. Contraindications for Procedure
- 5. Patient Positioning
- 6. Access Method
- 7. Ultrasound Guidance
- 8. Patient Management
- 9. Intravascular Pressure Measurements
- 10. Contrast Administration (i.e., ionic, nonionic, CO₂)
- 11. Equipment (e.g., imaging media, automatic injectors)
- 12. Exposure Technique
- 13. Image Enhancement
- 14. Closure Devices
- 15. Complications

(Section C continues on the following page.)



C. Vascular-Interventional Procedures (continued)

CATEGORY

6. Dialysis Management (11)

- A. Hemodialysis Graft/Fistula Study
- B. Thrombolysis
- C. Thrombectomy
- D. Angioplasty
- E. Stent Placement

7. Venous Access (9)

- A. PICC Lines
- B. Temporary Dialysis Catheter
- C. Tunneled Dialysis Catheter
- D. Port Placement
- E. Central Lines
- F. Peripheral IV

FOCUS OF QUESTIONS

Questions for each section of the exam may address any of the following factors, as appropriate:

1. Anatomy and Physiology
2. Pathology
3. Indications for Procedure
4. Contraindications for Procedure
5. Patient Positioning
6. Access Method
7. Ultrasound Guidance
8. Patient Management
9. Intravascular Pressure Measurements
10. Contrast Administration (i.e., ionic, nonionic, CO₂)
11. Equipment (e.g., imaging media, automatic injectors)
12. Exposure Technique
13. Image Enhancement
14. Closure Devices
15. Complications