Cardiac Interventional Radiography

Candidates for certification and registration are required to meet the Professional Requirements specified in the *ARRT Rules and Regulations*. ARRT's *Cardiac Interventional Radiography Clinical Experience Requirements* describe the specific eligibility requirements that must be documented as part of the application for certification and registration process.

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 the acquisition of the full range of clinical skills required in a variety of settings.

The requirements are periodically updated based upon a practice analysis which is a systematic process to delineate the job responsibilities typically required of cardiac interventional radiographers. An advisory committee then determines the number of clinical procedures required to demonstrate adequate candidate experience in performing the tasks on the inventory.

Candidates for cardiac interventional radiography certification and registration must document performance of a minimum of 180 repetitions of cardiac interventional radiography procedures according to the criteria noted below. Procedures are documented, verified, and submitted when complete via an online worksheet accessible through your account on arrt.org. ARRT encourages individuals to obtain education and experience beyond these minimum requirements.

A maximum of eight procedures may be logged each day on your ARRT online worksheet. To qualify as a complete imaging procedure, the candidate must demonstrate active, independent participation in a primary role throughout the entire procedure. Examples of primary roles include:

- scrubbing
- circulating
- monitoring

Completion of each procedure must be verified by an ARRT certified and registered technologist (Cardiac Interventional Radiography certification not required), cath lab manager (any credentialed healthcare provider), or licensed physician. The verification process is described within the online tool.

Remote scanning is not acceptable for completion of ARRT Clinical Requirements. The candidate must complete the examination or procedure at the facility where the patient and equipment are located. The candidate must be physically present during the examination or procedure.

For postprimary clinical experience requirement procedures, clinical verifiers are responsible for verifying the candidate's completion of procedures in accordance with ARRT requirements. Clinical verifiers are not required to directly observe the candidate performing the procedure and may perform their verification responsibilities remotely.

In addition, to ensure the highest level of patient care, candidates must document current advanced cardiac life support (ACLS) certification provided by an organization recognized by ARRT.

Specific Procedural Requirements

A. Mandatory Procedures

Left Heart Catheterization

Candidates must complete a minimum of 60 left heart catheterizations, and each heart catheterization must include at least two procedures from the following list. Up to 80 additional left heart catheterizations may be performed and counted as elective procedures.

- coronary angiography
- coronary artery bypass angiography
- aortography
- hemodynamics (*e.g., aortic pressure, end diastolic pressure [EDP])
- left ventriculography
- ventricular volume measurement/ejection fraction (EF)

Right Heart Catheterization

Candidates must complete a minimum of 10 right heart catheterizations, and each heart catheterization must include at least two procedures from the following list. Up to 80 additional right heart catheterizations may be performed and counted as elective procedures.

- cardiac output calculations (e.g., Fick, thermodilution)
- hemoximetry
- shunt detection
- pulmonary angiography
- hemodynamics
- valve measurement
- right ventriculography

Coronary Interventional Procedures

Candidates must complete a minimum of 10 coronary interventional procedures from the following list. Up to 80 additional coronary interventional procedures may be performed and counted as elective procedures.

- angioplasty
- stent placement
- atherectomy (directional, rotational, laser, or orbital)
- thrombectomy (mechanical or pharmacological)

*e.g., is used to indicate examples of the topics covered, but not a complete list.

B. Elective Procedures

A minimum of 100 repetitions of the elective procedures must be documented. Electives can be satisfied by: (a) completing any of the electives that appear on the list; or (b) completing additional repetitions of the mandatory procedures. Multiple different procedures can be documented for each patient. However, each individual procedure can be documented only once for each patient.

No Limit to Repetitions	Up to Five Repetitions for Each Procedure
• intravascular ultrasound (IVUS)	• peripheral angiography
• optical coherence tomography (OCT)	• coronary angiography
• intracardiac echocardiography (ICE)	• aortography
• transcatheter aortic valve implantation (TAVI/TAVR)	• vascular closure devices (e.g., permanent, nonpermanent)
• flow reserve (IFR, FFR, RFR)	• pericardiocentesis
• valvuloplasty	• endomyocardial biopsy
• ventricular assist device implantation	• foreign body removal/retrieval
• intra-aortic balloon pump (IABP)	• inferior vena cava (IVC) filter placement/retrieval
• distal embolic protection device placement/retrieval	• pacemaker, temporary insertion
• patent foramen ovale/atrial septal defect closure	• pacemaker, leadless
• ventricular septal defect closure	• cardioversion
• pacemaker implantation (permanent)	
• generator exchange	
• defibrillator implantation	
• arrhythmia ablation	
• electrophysiology study	
• intravascular lithotripsy (e.g., shockwave)	
• transcatheter mitral valve repair	
• atrial appendage closure device implantation	
• extracorporeal membrane oxygenation system placement (ECMO)	

Examples

A patient has a left heart catheterization with intervention to follow. Two vessels need stenting with atherectomy and mechanical thrombectomy of both vessels. The procedures should be documented as:

The following three procedures count as 1 left heart catheterization.

- 1 coronary angiogram
- 1 left ventriculogram
- 1 hemodynamic measurement

Each of the following count as an individual interventional procedure (3 total)

- 1 stent placement
- 1 atherectomy
- 1 thrombectomy

The preceding example counts as 4 total procedures.

The hypothetical scenarios that follow illustrate three ways of satisfying the 180 clinical experience requirements. Numerous other combinations are possible.

Candidate A: This person participated in 80 left heart catheterizations, 40 right heart catheterizations, 10 angioplasties, 30 intravascular ultrasounds, 5 cardioversions, 5 pericardiocenteses, 5 biopsies, and 5 foreign body removals.

Candidate B: This person participated in 110 left heart catheterizations, 35 right heart catheterizations, 15 angioplasties, and 20 electrophysiology studies.

Candidate C: This person participated in 130 left heart catheterizations, 40 right heart catheterizations, and 10 stent placements.

Candidate	Left Heart Catheterizations	Right Heart Catheterizations	Coronary Interventional Procedures	Elective Procedures
A.	80	40	10	50 (50 electives covered by overflow from mandatory procedures)
B.	110	35	15	20 (80 electives covered by overflow from mandatory procedures)
C.	130	40	10	0 (100 electives covered by overflow from mandatory procedures)