

Operator Staff and Training Requirements

Mazen Abu-Fadel, MD, FSCAI

Jayant Bagai, MD, FSCAI

Christine Gasperetti, MD, FSCAI



SCAI QIT
Quality Improvement Toolkit

Disclosures:

- **Abu-Fadel, Mazen.** No relevant relationships with commercial interests to disclose.
- **Bagai, Jayant.** No relevant relationships with commercial interests to disclose.
- **Gasperetti, Christine.** Boston Scientific, PI. Abiomed, Honoraria.

Cath Lab Staff Required Qualifications

Type of Staff	Degrees	Experience	Training
Licensed Nurse	One or more of following- RN, APRN, BSN, NP-C, CNS, CVRN, CRN, RCIS	At least 6 months experience in critical care (ICU, ER, cath lab)	BLS and ACLS (PALS), \geq 15 hours of documented accredited CE relevant to heart disease every 3 years, including 1 hour of radiation safety training every 3 years
Licensed Technologist	RCIS or RT (R) meeting either cardiac or cardiovascular interventional radiography qualification	\geq 1 year of full-time equivalent experience as CV cath technologist/specialist under direct supervision of personnel meeting pathway (as in column on left)	BLS, recommended ACLS (PALS), \geq 15 hours of documented accredited CE relevant to heart disease every 3 years, including 1 hour of radiation safety training every 3 years

All staff must comply at all times with all federal, state and local laws and regulations, including but not limited to laws relating to licensed scope of practice, facility operations and billing requirements.

Core/Basic Competencies

- Nurse
 - Administering and monitoring conscious sedation
 - Assessment and monitoring clinical status of patient
 - Theoretical and practical knowledge of medications used in cath lab
 - Knowledge of radiation safety, infection control and hemodynamic support
 - Communicating with patient care team, patient and patient's family
- Technologist
 - Recording patient history and clinical data; recording physiological data
 - Patient positioning, selection of radiation exposure parameters, imaging and archival
 - Thorough understanding of equipment, supplies, troubleshooting
 - Assisting physician as scrub person; circulating and procuring supplies if needed



SCAI

Society for Cardiovascular
Angiography & Interventions



Cath Lab Manager Qualifications

Type of Staff	Degrees	Experience	Training
Cath Lab Manager	Appropriately credentialed technologist and/or nurse with RCIS certification	Minimum of 5 years experience (preferably in a cardiac catheterization lab) with strong leadership qualities.	BLS and ACLS (PALS), \geq 15 hours of documented accredited CE relevant to heart disease every 3 years, including 1 hour of radiation safety training, every 3 years



Responsibilities of Cath Lab Manager

- Leadership through motivation, positive communication, team building and accountability
- Operations planning
- Maintaining safety and regulatory standards
- Quality monitoring and management
- Budgeting and resource allocation
- Personnel management

Responsibilities of Clinical Staff Leader (CSL)

- People management/leadership
 - Supervision of day to day performance
 - New staff coaching and assessment
 - Problem solving skills
- Communication
 - Feedback, performance improvement counseling
- Compliance and safety
 - Supports delivery of quality patient care
 - Monitors staff training and compliance
 - Implements area specific policies and guidelines
 - Manages PDSA cycles
 - Demonstrates clinical knowledge to coach staff
 - Identifies and addresses customer service issues
- Planning and organization
 - Resource management
 - Provides input for budget

Staff education and certification

- Society of Invasive Cardiovascular Professionals (SICP)
 - Established in 1993, recommends educational curriculum for invasive Cardiovascular Technologists (CVT)
 - Now merged with Alliance of Cardiovascular Professionals (ACVP) professional society
 - [2015 Educational Guidelines for Invasive Cardiovascular Technology Personnel in the Cardiovascular Catheterization Laboratory](#)



Staff credentialing

- Cardiovascular Credentialing International (CCI)
 - Credentialing organization for invasive CVTs, including both RN and RT(R) staff
 - Registered Cardiovascular Invasive Specialist (RCIS) Certification after passing exam; endorsed by ACC
 - SICP recommends at least one RCIS per cath lab
 - Requires renewal after 1 year; then every 3 years with fees and continuing education
 - [RCIS examination overview](#)
- Commission on Accreditation of Allied Health Education Programs (CAAHEP) and Joint Review Committee on Education in Cardiovascular Technology (JRC-CVT)
 - Develop accreditation standards and guidelines for post-secondary educational programs in invasive CVT
 - CAAHEP-accredited invasive cardiovascular program graduates eligible to sit for RCIS exam

Ongoing education, training and assessment

- Written and practical exam recommended; materials available from CCI and SCIP
- Additional training and skills assessment for complex procedures- coronary (CTO, atherectomy, high-risk PCI, mechanical circulatory support), endovascular (carotid, stroke, EVAR, TEVAR) and structural (TAVR, MitraClip, perivalvular leak closure, LAA occlusion, valve-in-valve and percutaneous MV replacement)
- Mentorship and cross-training
- Annual skills review with remedial process
- Continuing education credits, webcasts, conference attendance- concept of “lifelong learning”

Can Function Independently	Date	Initials
• Room start up and rebooting sequence	___	___
• Sterile Tray set up and prep patient	___	___
• Transducer set up	___	___
• Left heart cath assist	___	___
• AS valve case	___	___
• Prep Arm case	___	___
• Pericardiocentesis	___	___
• V-gram medrad set up and injection	___	___
• Perform LV EF digital analysis	___	___
• Rotational atherectomy set up	___	___
• Emergency pacemaker set up / insertion	___	___
• Defibrillation	___	___
• Vagal Reaction	___	___
• Sheath removal / Holding pressure	___	___

Catheterization Laboratory RN Critical Knowledge Assessment

1. What is the standard dilution for nitroglycerine?
2. Which of the following drugs do not need to be adjusted for renal dosing?
 - a) Bivalirudin
 - b) Heparin
 - c) Low Molecular Weight Heparin
 - d) Tirofiban
3. A patient is overly sedated and by physician assessment needs reversal of versed. What is the preferred agent and what is the initial dose?





Operator (MD) Requirements

- Successful completion of COCATS Level III training undertaken during a dedicated Interventional Cardiovascular (IC) training program
- ABIM certification in IC and maintenance of certification (MOC) are strongly recommended
- ABIM Recertification-traditional 10-year MOC exam or new 2-year knowledge check-in MOC exam
- Minimum volume of 50 PCIs per year, averaged over a 2-year period, to maintain competency
- 30 CME hours every 2 years

[Harold JA et al. ACCF/AHA/SCAI 2013 Update of the Clinical Competence Statement on Coronary Artery Interventional Procedures](#)

Operator PCI volume

- Operator volume is only one of several factors that should be considered when assessing an individual operator's competence
- Other factors to consider include (but are not limited to): performance of additional noncoronary cardiovascular interventional procedures, lifetime experience, ABIM certification in IC, attendance at educational symposiums, CME credits, and simulation courses
- Operators performing <50 PCIs/year should not be denied privileges or excluded from performing PCI based solely on their procedural volume
- Alternate pathways (independent institutional committee or an external review organization) to evaluate performance of low-volume (<50 PCIs annually) operators should be established and monitored

Qualifications of Cath Lab Director

- MD or DO with board certification in Cardiology/Interventional Cardiology (Adult or Pediatrics)
- Minimum 5 years of experience with strong leadership qualities
- BLS and ACLS certified
- Completion of radiation safety training
- Leadership, team management and communication skills

Responsibilities of Cath Lab Director

- Oversight, review and updates of cath lab policies and clinical practices
- Establishment and monitoring of QI programs and conferences (MMI, cath conference)
- Establish criteria for MD credentialing and recredentialing
- Periodic performance review (OPPE, FPPE), recommendations for renewal of privileges
- Review performance of trainees and staff and provide necessary training to personnel
- Ensure adequate resources and safe use of equipment; inventory decisions, procurement and budgeting
- Oversight of patient scheduling, referral services, post-procedure reporting and tracking of quality measures (including appropriate use and complications)
- Conflict resolution, team building

Daggubati et al. Chin Med J. 127. 1194-6

Question 1- During MM & I conference, questions were raised regarding the effect of PCI volume on quality of procedures. Which of the following is correct?

- A. Many consider those with higher PCI volumes to be better operators. Because Dr. X is a high-volume operator, it can be assumed that there are no quality issues in his cases with adverse events.
- B. Dr. Y performs 60 PCIs/year but his volume has lesser impact on patient given his lifetime experience of performing PCI with good outcomes and high institutional PCI volume.
- C. During the past 10 years, overall PCI volume has diminished, with mean annual PCI volume of 59. Operators performing <25 cases/year are now considered to low-volume operators.
- D. During the past 10 years, overall PCI volume has diminished, with mean annual PCI volume of 59. Operators performing > 400 cases/year are now considered to high-volume operators.

Answer: B

A 2013 ACCF/AHA/SCAI publication lowered the minimum annual PCI volume (averaged over 2 years) to 50. In addition, a significant interaction has been noted between operator and institutional PCI volume, with lower rates of in-hospital mortality and CABG in patients undergoing PCI by operators performing > 75 PCIs/year in hospitals performing > 400 PCIs/year . Answer A is incorrect-while high volumes are not discouraged, case volume is not a substitute for quality and appropriateness. Answer C is incorrect-operators performing <50 cases per year are considered to have low volumes. Answer D is incorrect-operators performing >100 cases per year (averaged over 2 years) are considered to have high volumes. Operators performing 50-100 cases per year are considered to have intermediate volume.

Harold JG et al. ACCF/AHA/SCAI 2013 update of the clinical competence statement on coronary artery interventional procedures. J Am Coll Cardiol. 2013;62:357–396.

Question 2- A study by Fanaroff et al assessing 4 million PCIs performed by >10,000 operators at >1500 centers confirmed that operators who continue to achieve higher volumes have been found to have lower mortalities. Which of the following is true?

- A. There was no difference in risk-adjusted in-hospital mortality between low (< 50), intermediate (50-100) and high volume (> 100) operators
- B. Operators with higher volumes were more likely to be found in the North and Midwest
- C. Procedural success was similar for all operator volumes
- D. PCIs performed by high-volume operators were more often in patients with STEMI than those performed by intermediate- or low-volume operators



Answer: B

In this study, operators in the western part of the U.S. had the lowest annual volumes, followed by operators from the South, Midwest, and North. Answer A is incorrect-adjusted risk of in-hospital mortality was higher for PCI procedures performed by low- and intermediate-volume operators compared with those performed by high-volume operators. Answer C is incorrect- while procedural success rates were > 92 % for all operators, success rate was highest (94.2% vs. 93.3% vs. 92.6%) and the risk of new in-patient dialysis was lowest for high-volume operators. Answer D is incorrect-PCIs performed by low-volume operators were more often in patients with STEMI/emergency PCIs than those performed by intermediate- or high-volume operators

Fanaroff AC et al. J Am Coll Cardiol. 2017 Jun 20;69(24):2913-2924.

Question 3- You are trying to hire a new nurse for the cath lab. One of the candidates has excellent recommendations and appears to be competent, friendly and dedicated. She has worked in same day surgery for 3 years. As the nurse manager, you should-

- A. Hire her immediately
- B. Inform her that she does not qualify as she does not have at least 6 months of critical care experience before working in the cath lab
- C. Inform her that she will need a period of supervision and on the job training
- D. Hire her if she has BLS, ACLS training

Answer: B

While good work ethic, personal attributes and required certification are important considerations for hiring new cath lab staff, critical care experience in the ICU for at least 6 months, and ideally 1 year are generally required before a nurse can work in the cath lab for the first time. This is due to the high complexity and rapid changes in patient's clinical status that can occur in the cath lab, which requires significant prior experience of assessing and managing critically ill patients.