Hospital A
Source: Director, Cardiac Catheterization Lab

Hospital A is an 800-bed, not-for-profit teaching hospital located in the South that maintains eight hospital-based catheterization (cath) labs and one freestanding cath lab located across the street from the hospital. The cath lab has been in operation since 1973. Annual cath lab volumes are as follows:

- 3,400 diagnostic procedures
- 2,800 interventions
- 2,200 EP procedures

Three clinicians staff each procedure—two registered nurses (RNs) and one radiologic technician (RT) or one cardiovascular technician (CVT). The entire clinical staff includes the following individuals:

- 38 RNs
- 12 RTs
- 8 CVTs
- 4 patient care assistants (PCAs)

The lab is supported by multiple administrative staff members, listed below:

- 2 clerical and front desk workers to complete physician reports and perform administrative duties
- 2 coding and billing administrators
- 2 RNs managing the American College of Cardiology (ACC) registry
- 2 schedulers

Additionally, the following manager- and director-level staff oversee cath lab operations:

- 2 managers
- 1 database coordinator
- 1 director

While the cath lab does not have traditional pre- and post-operative holding areas, administrators have devised an alternative model that has been exceptionally successful in maximizing staff capability and fostering efficient throughput. The cath lab operates a 28-bed outpatient unit and a 30-bed interventional cardiology unit that are utilized only by cath lab patients. The outpatient unit is staffed with a 1:6 nurse-to-patient ratio and the interventional unit is staffed with a 1:4 nurse-to-patient ratio. Staffing by ratio to patient occupancy—rather than by set standards—is preferable for nurses, as they feel that their services are always being utilized when they are staffing one of the recovery units. This unit is open during all clinic hours.

The units are also preferable to traditional pre- and post-op holding areas since patients are seen in the units both before and after their procedures; the same nurses can perform both pre- and post-operative tasks. When patients arrive for their procedures, they are prepped in an area of the outpatient unit; after their procedures they are brought back to the outpatient or interventional unit for sheath removal and recovery.
The director of the cardiac cath lab believes that while Hospital A has a high-volume cath lab, the model described above can be duplicated in a smaller setting. She noted that the freestanding cath lab—operated by Hospital A and located across the street from the main campus—employs the same staffing ratios and recovery room structures. That facility has two cath labs and eight beds each for outpatient and interventional recovery areas.

**Hospital B**  
Manager, Cath Lab

Hospital B is a 300-bed, not-for-profit community hospital located in the South. The cath lab—which was opened in 1976—maintains annual volumes of approximately 2,200 patients.

The clinical staff is composed of eight RNs and eight RTs. Additionally, the pre- and post-care unit—which is described in further detail below—employs a patient care technician (PCT). These clinicians work on cases in teams of three or four, depending on patient acuity level and time of day. The structure is one RN and two RTs at a minimum, and two RNs and two RTs for more complicated cases or for call scheduling. On the administrative side, the lab employs two secretaries who are responsible for scheduling and film retrieval.

Approximately four years ago, hospital staff converted a holding room into the Pre-/Post-Care Unit, primarily to be used for cath lab patients but also available to interventional radiology patients. In particular, administrators hoped to improve patient flow and both patient and staff satisfaction. By tracking the increased throughput and using satisfaction surveys to gauge the unit’s impact, the cath lab manager believes that these goals have been achieved.

The nine-bed unit, which also has a small area containing several recliners, is now used to care for patients both before and after they enter the cath lab. Following admission, patients are prepped in the Pre-/Post-Care Unit by a nurse; if they can be discharged following the cath, the PCT returns the patients to the unit and they are directly released. If patients require further hospital care, they are admitted directly to the coronary care unit (CCU).

**Hospital C**  
Director, Cardiology

Hospital C is a 200-bed, not-for-profit community hospital located in the South. While the cath labs have been in operation since 1991, the labs were renovated in 2001. The hospital currently has two cath labs and space is available for a third lab.

Average monthly volumes are 120, for a yearly total of approximately 1,440 procedures. The cath lab is staffed by the following clinicians:

- 6 RNs
- 3 RTs
- 1 registered cardiovascular invasive specialist (RCIS)
These clinicians are divided into three teams of three clinicians each. While two RNs and one RT usually comprise a team, teams are occasionally composed of two RTs and one RN. However, each team must have at least one RN at all times. The RCIS serves primarily as an inventory manager and supervisor, but can serve as a tech on a team if demand is high. Additionally, the cath lab manager is a nurse, and he can fill an RN role if necessary. He also steps in on cases in the event of a crisis.

While non-clinical staffing is operationally separate from clinical staffing in the cath lab, all non-clinical staff have clinical backgrounds and can serve as clinicians if case load outpaces the capacity of the normal clinical staff. The lab is overseen by the director of cardiology—an RN—whose major responsibilities include cath lab management. Her administrative assistant supports all heart and vascular services, and an administrative PCA also assists RTs and RNs on the cath teams.

The cath lab contains both pre- and post-procedure holding areas, which operate from 7:30 a.m. to 4:00 p.m. These are also the hours of the cath lab. Patients spend 30 minutes to an hour in the post-procedure area, where their sheaths are pulled by a nurse if the patient is well. After the patients are stable, they are either sent to the intensive care unit (ICU) or to the telemetry unit.

This unit is generally staffed by one nurse and one tech. These are usually the same individuals that performed the patient’s procedure. Such an arrangement promotes clinician-patient continuity and gives RNs and techs a break in between cases. However, on busy days when cases overlap, nurses and techs can combine holding area duties to maximize staff capacity. Nurses and techs rotate holding area shifts throughout the day.

**Hospital D**
Director, Diagnostic Cardiology

Hospital D is a 500-bed, not-for-profit community hospital located in the South. The cath labs—which were established in the mid-1970s—maintain volumes of approximately 5,500 patients per year.

The cath lab is overseen by the director of diagnostic cardiology, who is herself an RN. She oversees a nurse manager for the cath lab, as well as the following clinicians:

- 25 RNs
- 8 RTs
- 2 PCTs

PCTs are used primarily to transport patients and also for various supply-related tasks such as washing instruments. While administrators do not have a set standard for the number of clinicians on a particular case, only RTs can conduct X-rays and only RNs can circulate. The number and mix of clinicians depends on case complexity and nurse availability. For example, a straightforward case might utilize three RTs and one RN, and a complex case could involve as many as three RNs and an RT.

The 11-bed holding area is staffed by six RNs, one PCT, and one secretary who handles administrative duties for the cath lab. The unit is open from 5:30 a.m. to 7:00 p.m. All nurses are trained in cath lab operations. While these nurses do not currently move between the cath lab and the holding area, they have expressed interest in doing so to alleviate boredom and provide better continuity for patients.
**Hospital E**
Source: Operations Manager, Cath Lab

Hospital E is a 600-bed, government-owned community hospital located in the South. The cath lab has been in operation since the mid-1980s and maintains annual patient volumes of 6,000 to 6,500 patients per year.

Due to a recent surge in volume—coupled with an unexpected trained tech shortage—the cath lab is currently understaffed. At the moment, the lab employs the clinicians listed on the following page, all of whom also serve as administrative staff.

- 28 RNs
- 15 RTs
- 2 PCAs
- 1 transporter

Administrators believe that six additional techs—which would bring the total to 21—would ease staffing difficulties. Since the RTs become highly specialized through their intensive work in the lab, they can perform many duties usually assigned to RNs. Administrators feel that adding more techs will be the most efficient way to decrease work overload without having to pay a full RN salary. Each procedure is staffed by one RN and two RTs.

The pre- and post-op holding areas are also staffed by nurses and techs. The pre-procedure area has four beds and is staffed by a minimum of two RNs; the post-procedure area has six beds and is staffed by a minimum of three nurses. The hours of these areas are 7:30 a.m. to 9:30 p.m.—the same hours as the cath lab.
**Research Methodology**

During the course of research, Original Inquiry staff searched the following resources to identify pertinent information:

- Advisory Board’s internal and online (www.advisory.com) research libraries
- Factiva™, a Dow Jones and Reuters company
- Internet, via search engines and multiple websites

Based on leads generated from the above sources, researchers contacted cardiology and cath lab administrators.

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