An Evaluation of Cath Lab Turnaround Time

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With the rising cost of health care and decreasing reimbursements from third-party payers, health care organizations must find a way to protect their bottom line. One area frequently reviewed is supply utilization and costs. Although supply cost reduction is still a very attractive goal when looking at trimming the budget, it is no longer at the forefront of cost reduction initiatives. Most health care organizations have negotiated price reductions to a point where continued discounts may not be possible. Hospital administrators are challenged to look beyond dollars and cents and be creative when looking for solutions.

In the cardiac catheterization laboratory, realizing a return on investment is increasingly difficult, especially with the limitations in reimbursement predicted for the future. Over the next several years, cardiovascular programs will be faced with payment reductions from CMS and other insurers, particularly in the historically profitable cardiac DRGs. Cardiac cath lab administrators and managers must scrutinize how they can offset this decline in reimbursement to be able to realize a profit. Historically, this has been accomplished by either looking at staff and/or supply reductions. However, administrators have negotiated and renegotiated pricing with their vendors to the point where they may be getting the "best" deal and there may not be opportunities for more discounts. Over the years, cath labs have also learned how to work "smarter" by cross-training employees to perform multiple tasks, thereby reducing the number of staff members needed to accomplish most patient care activities. Where can administrators turn for the next opportunity to cut costs and increase profits?

In the cardiac cath lab, one area that may provide an opportunity for cost savings is maximizing patient throughput. Having a well-defined throughput process can optimize lab utilization. Getting each patient into and out of the procedure room in a timely manner can add minutes and maybe even hours to the daily schedules, allowing for the accommodation of a greater number of cases. Increasing the number of procedures performed per day or week can add to overall income.

Even though a cath lab manager may believe their throughput process is the best that it can be, it is always of benefit to examine it closely, in order to be absolutely certain there is no room for improvement. One way this can be accomplished is by conducting an in-depth review of all activities that must take place in order to get the patient in and out of the procedure room. There is no better way to identify problem areas within the process. By identifying roadblocks and determining if there are opportunities to expedite the process, turnover time can be reduced.

Many factors affect the patient throughput process in the cardiac cath lab. What occurs pre-, intra- and post-procedure is very important to the process. Did the patient arrive in the suite on time? Was all the appropriate documentation available, *i.e.*, blood work results? Were all the appropriate supplies needed for the procedure available? Was the patient on the table at the scheduled time? A negative response to any of these questions can delay the current procedure and definitely delays the start of the next case.

Achieving optimal throughput time is also very dependent on procedure room turnaround time. What is procedure room turnaround? Turnaround time is defined and measured in several different ways. Some labs define turnaround time as the time that one patient leaves the procedure room until the time the next patient enters the same room. Another may measure it as the time one patient leaves the procedure room until the room is ready for the next case. No matter what definition your institution

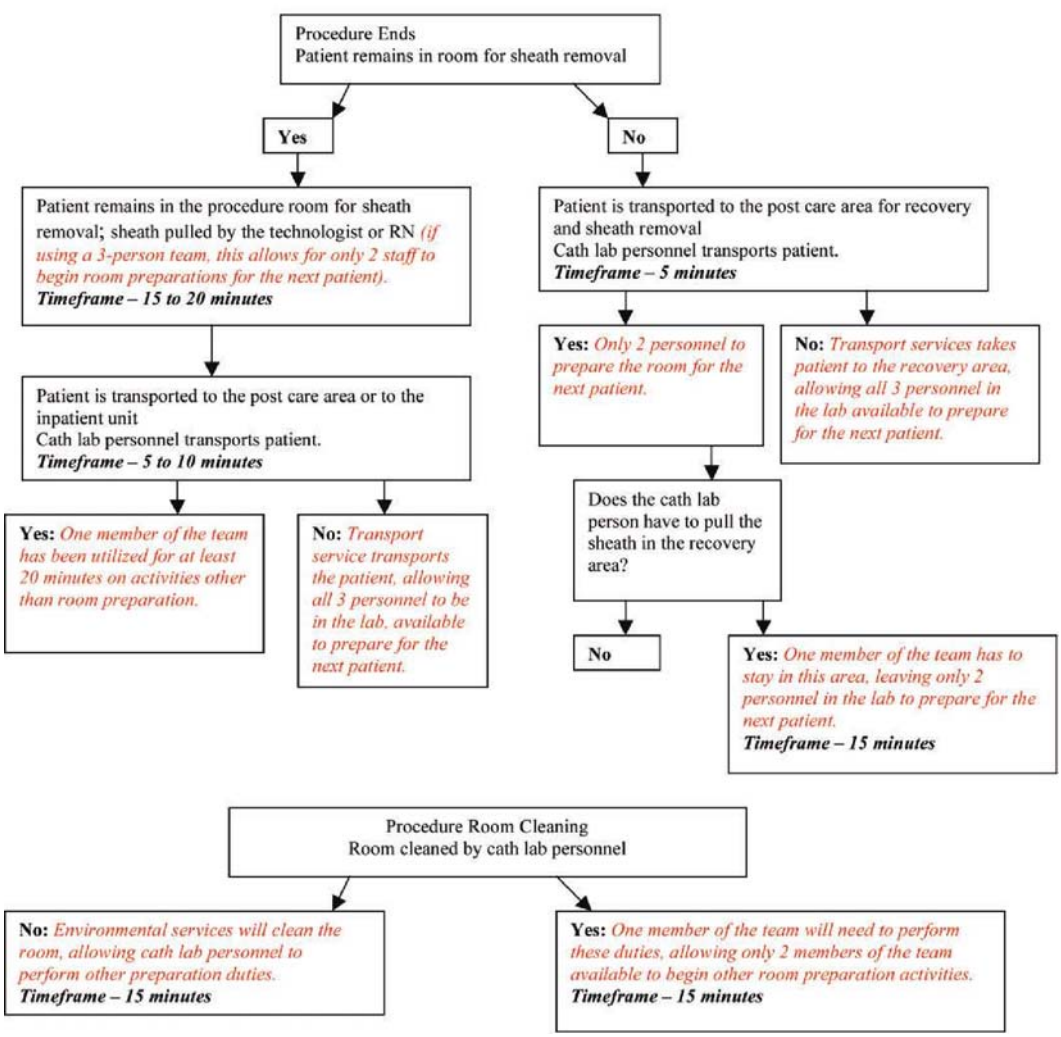

Figure 1. Sample Informal Flow Chart for the Evaluation of Cardiac Cath Lab Turnaround Times
There are many steps in the turnaround process of a cardiac catheterization lab. Every lab has their own way of completing each step. By documenting and analyzing what is involved in completing each step, you may discover ways to improve your processes and save time and money. This sample flow diagram outlines a few of those processes and can get you started outlining your own processes.

uses to identify the turnaround timeframe, the crucial aspect is what activities take place during that specific phase. Activity components of this time period usually involve tasks such as transferring the patient off the procedure table, transporting them to a recovery bed or an inpatient room, sheath removal and groin management, and cleaning and preparing the procedure room to accept the next patient. In order to determine your cath lab's turnaround time, you need to identify the key processes involved in preparing to accept the next patient and determine their effectiveness.

Begin by performing an in-depth review of each step of the process, outlining all the activities involved and monitoring the time it takes to complete each of the steps. Identify what takes place at the end of a procedure. List all the steps necessary to discharge the current patient from the procedure room and prepare the room for the next patient, up to when the next patient enters the room. This may be done by documenting the processes in a workflow diagram. A workflow diagram will provide a detailed overview of the activities associated with each step in the turnaround process. It will allow you to perform the review, scrutinizing each step to determine if it can be performed differently, performed in a more timely fashion or if it can be eliminated.

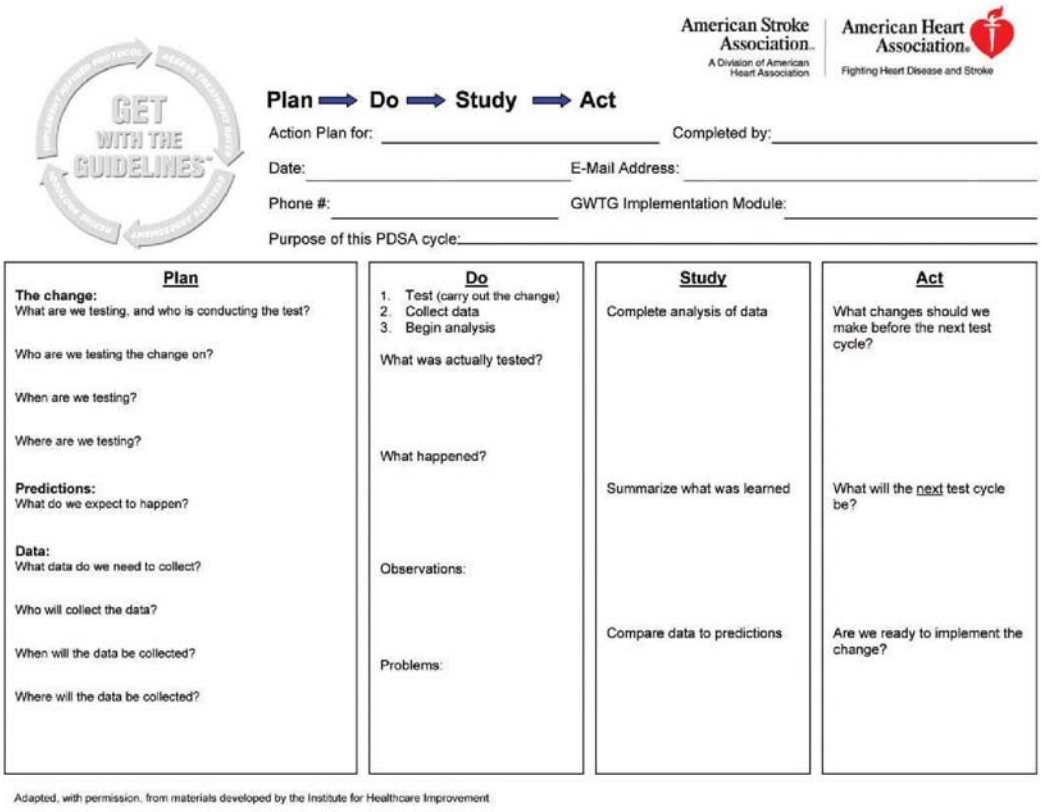

Figure 2. American Heart Association/The Institute for Healthcare Improvement Plan-Do-Study-Act Worksheet.
This worksheet allows you to document and evaluate each step of the Plan-Do-Study-Act Cycle and can be adapted to meet the needs of a cath lab turnaround time analysis.
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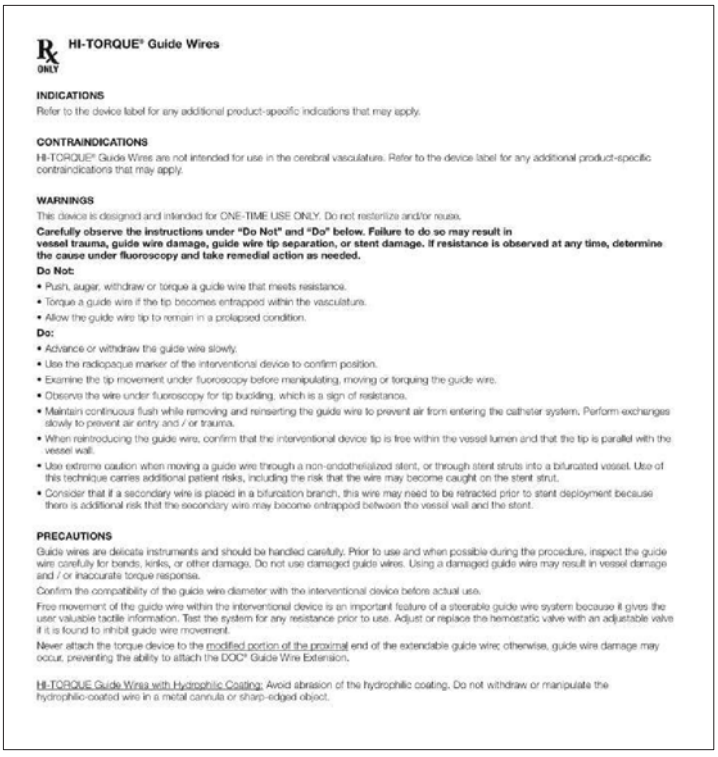
Every institution has specific barriers that may prevent them from achieving ultimate procedure room turnaround times; however, there are some aspects that are universal and may apply to all institutions. For instance, at the end of a diagnostic procedure, is the patient moved to a recovery area where the sheath is pulled or is this done in the procedure room immediately after the case? Who is responsible to pull the sheath? If your patient remains in the procedure room to have their sheath pulled, this could add, at minimum, 15 to 20 minutes to your turnaround timeframe. If sheath pulling is the responsibility of the cath lab staff, even when the patient is in the recovery area, that staff member will be unavailable to assist with room preparation for the next patient.

Who is responsible for transporting the patient to the recovery area or inpatient unit? Is this the responsibility of the cath lab staff or is there an escort service available that can transport stable patients? If a member of the cath lab team has to leave the suite to transport a patient to the recovery area, they will be unavailable to help set up the room for the next patient. Utilizing the entire team to prepare the procedure room can slash minutes from your turnaround time.

Another area to review with the aim of eliminating minutes from turnaround time is procedure room cleaning. Who is responsible for cleaning the procedure room between cases? Is this the responsibility of the cath lab staff or is there a dedicated environmental service employee assigned to the cath lab suite? Although the cleaning procedure between cases may be rapid, this task does require a cath lab staff member if your cath lab is not using environmental services.

Analyzing what happens at the end of a procedure until the beginning of the next is only one aspect in the evaluation of the throughput process in the cardiac catheterization lab. In order to gain a complete picture of what must take place during your turnaround time, you can flowchart the entire process using formal or informal diagramming techniques. Figure 1 demonstrates one method of informal flowcharting of procedure room turnaround activities. There are other ways that turn around activity can be outlined, such as documenting the roles and responsibilities of each team member in a flow diagram.

Another popular method that can be utilized when analyzing the throughput process is the quality improvement model, Plan-Do-Study-Act (PDSA) cycle. This model has been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used extensively in the health care field. The cycle consists of small-scale tests of planned actions, followed by assessment and improvement of the initial plan. Once you have your goal set (*i.e.*, decrease procedure room turnaround time) and have identified changes that you can make to help achieve this goal, the PDSA cycle can test these changes. Begin by identifying one aspect of the procedure room turnaround process that could be altered in order to save time and develop a plan to implement the change. Once you have implemented the change, you need to collect data that will help you determine that the change is achieving the results you expected. The next step is to analyze the data, compare what you find against what you expected to happen, and summarize what you learned. Finally, use what was learned to improve the planned action. Figure 2 is a sample worksheet from the American Heart Association that uses the PDSA methodology for implementing "Get with the Guidelines."

No matter what method you use to flowchart your process, this endeavor can help you analyze the turnaround procedure by breaking it down into individual events. You can then closely review these events, the time it take to accomplish them and determine if there are other methods by which some of these events can be accomplished in order to shave minutes off your turnaround time. Improving processes is strongly linked to improving outcomes. Improving the throughput process can improve efficiencies and ultimately give back minutes or hours that can be added to the daily schedule, ultimately allowing a greater number of patients to be scheduled. ■

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This article was peer-reviewed by members of the Cath Lab Digest *Editorial Board.*

Commentary:
An Evaluation of Cath Lab Turnaround Time

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This well-written article by Rose Czarnecki, RN, BSN, MPM, highlights some good points that may lead to long turnaround times between patients. Years ago, our lab looked at turnaround times and changed many of the practices we had in place in order to improve our times. We went from a 30-35 minute turnaround time to approximately 20 minutes. Some of the following changes we implemented to improve our turnaround times may be helpful to other cath labs seeking to decrease their times as well:

- We opened a 5-bed staging area where all sheaths are pulled. Interventional patients are monitored there for 4 hours after hemostasis (in an attempt to decrease groin complication rates). The staff in the staging area pick up and return patients to their rooms, thus freeing up cath lab staff. Cath lab staff also do not have to pull sheaths and hold pressure. The staging area direct admits patients to the cath lab when there is a bed issue. All of our outpatient cardioversions, transesophageal echos (TEEs), tilt table and outpatient cardiac biopsies done by echo go through this area also. We also recover interventional radiology patients when there is a staffing issue in radiology.

- The cath lab staff used to clean the rooms after procedures, *i.e.*, mopping the floor, etc., but an environmental staff person was assigned to the lab and holding area. This helped to decrease times spent cleaning the rooms.

- We have an inventory person who checks and orders all the supplies for the lab. She checks supplies in each cath lab daily.

- We have one cath lab staff assigned each day as a lead, a position that rotates through all staff on a daily basis. This person makes staff assignments and takes care of sending for patients, pre-medicating patients and arranging for beds after procedures. The lead is also responsible for adjusting staffing when emergencies come in.

- The lead also is in constant touch with the nursing supervisor and leads on the nursing units to keep the flow of patients moving.

- Each staff person is assigned a room by the lead on a daily basis. The tasks of crash cart check, narcotics check, quality analysis on O2 sat machines and ACT machines, and temperature logs for contrast and refrigerated meds are usually done by the nurse assigned to the room. Stocking supplies is done by all the staff in the room and our inventory person. We have found this helps to keep rooms always stocked and ready.

- Interestingly, we initially thought that the physicians held up cases by frequently being late. After some study, we found physicians were not really the main source of long turnaround times. Of course, some physicians were indeed late, but the impact was not as large as we first estimated.

As a result of the way we have organized our lab, we can come up with a crew quickly for emergencies and when cases run late and a fourth room needs to be opened. We also have cross-trained staff to make each staff person more flexible in terms of what they can be assigned to do in each room. It has worked well and the flow is much improved. We encourage other cath labs who are trying to improve their turnaround times to first look closely at their current practices and do a time study to determine where their problems are. Once the problems are identified, you can develop a plan to correct them. Get input from your staff on what the problems are and solutions that may help to remedy them. Do another time study once you have instituted these changes and see if the turnaround times improve.

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