Effective Ways to Decrease Costs of Labor in a Cardiac Catheterization Lab

By Deephak Swaminath, MD, and Ashwani Kumar, MD

In this article...

A Texas hospital was able to decrease the cost of labor per patient by 23 percent for a projected cost savings of $250,000/year in its cardiac catheterization lab.

High-quality patient care is the goal of every hospital. Obstacles, including rising labor costs, labor shortages, poor reimbursement, increasing numbers of uninsured patients and increasing patient demand, force many health care organizations to deal with financial shortfalls in order to deliver the same level of quality of care.

A study by Caroline Steinberg, vice president for trends analysis at the American Hospital Association concludes that wages, salaries and benefits accounted for 35 percent of the growth in health care expenses between 2004 and 2008, making it the largest single driver of operating costs.[1]

To overcome these obstacles and deliver superior quality care, best practice health care organizations are realizing the need to effectively manage the largest controllable expense and the greatest asset—employees.

That's exactly the approach taken in the cardiac catheterization lab at University Medical Center (UMC) in Lubbock, Texas, in a project designed to control labor expenses.

At UMC, six teaching cardiologists and three community cardiologists use the three cardiac catheterization labs and one electrophysiology (EP) lab with a case volume of 2,796 patients per year.

Cardiac catheterization labs are typically highly stressful places because of the hectic work schedule and the acuity of patients. Most days are unpredictable due to the scheduling of urgent and emergent cases. Senior leadership noted increased overtime and poor employee satisfaction in the cardiac catheterization lab.

The main objective of the project in the cardiac catheterization lab was to effectively manage the controllable expenses, including the cost of labor, using a team approach. Team members included the medical cardiac catheterization lab director, nursing director, chief operating officer, radiology technician and nurses. Initial observation revealed the following issues:

- Lack of clear definitions for operational metrics relevant to the process, including first case start times, prime times, and emergency case criteria
- Delays in first case start times
- Costly overtime hours common on certain days of the week
- Wide day-to-day variation in case volume
- Routine late-in-the-day scheduling of non-emergent cases

The team came to the conclusion that the first case start time would be 8 a.m., prime time would be between 8 a.m. and 4 p.m., and the cases falling under the emergent criteria would be classified as emergent, urgent and semi-urgent. This definition was collectively approved by all the cardiologists.

The new policy explaining the first case start time, prime time, and emergency case classification was approved by management and communicated to all the employees in the cath lab. The cases after the prime time would be done only if they were emergent or urgent.

Costly overtime was another issue that led to increased cost of labor. The team identified elective cases that were performed beyond designated prime time hours on certain days of the week. This occurred primarily due to the following reasons:

- Poor scheduling of cases and inappropriate distribution of block times for the cardiologists

- Scheduling of non-emergent and non-urgent cases late in the day after the prime time
- At times due to emergent and urgent cases the elective cases were bumped and performed after the prime time

To overcome these issues we looked to the queuing theory, which is a methodology that allows one to match random demand with fixed capacity.[2] Queuing principle has been widely used in banking, airline, Internet and telecommunication industries.[2]

Queuing principles were applied to identify the number of rooms necessary for emergency and urgent cases. Initial analysis revealed that reserving an "emergency room" led to under-utilization of the rooms and it was possible to absorb emergency cases into the regular schedule if the flow of patients on various days was made more uniform.

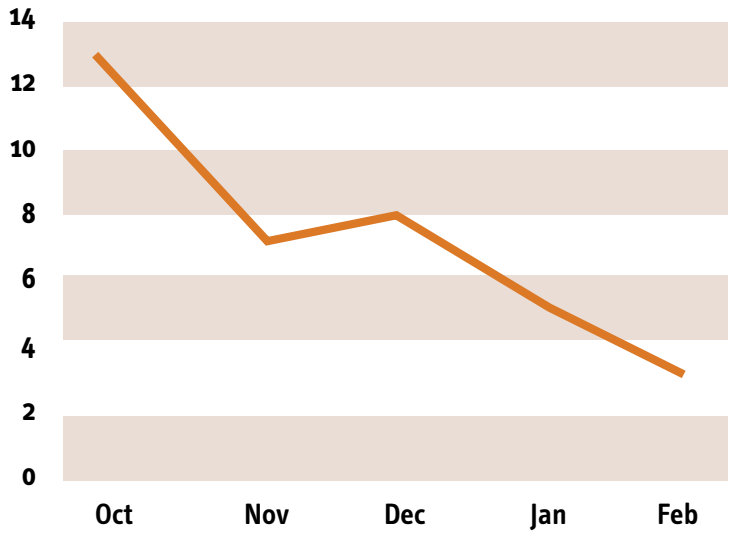
Inappropriate scheduling led to increased case volumes on Mondays, Wednesdays, and Fridays. To minimize the scheduling disparities, certain cardiologists' blocks were changed from Wednesday to Thursday and from Friday to Tuesdays with the help of chief of cardiology and the medical cath lab director.

If elective cases were performed after the designated prime time, the chief and medical director were notified. These reports were discussed in monthly cardiology section meetings, leading to peer pressure to change behavior.

Change pays off

The data were collected daily and analyzed. Once the start time, prime time, emergency criteria were defined they were strictly followed and monitored, and any deviation was reported and discussed in the monthly cardiology section meetings.

Figure 1: Elective case after prime time decreased drastically from October to February as a result of the project.



All the cardiologists followed their new blocked time for the elective cases. The new protocol resulted in a 75 percent reduction (Figure 1) in elective cases performed after prime time on weekdays between the months of October 2009 and February 2010.

As a next step in improvement, the team focused on the day-to-day variation in case volume. After collecting data for nearly three months, prior to implementation of new policy, a detailed analysis indicated that the variation in the case volume existed because of inappropriate distribution of the cardiologist block times. After making the appropriate changes in the blocked schedule, the variation (Figures 2 and 3) in case volume decreased between weekdays.

As a result of the project, the cost of labor per patient decreased by 23 percent (Figure 4) in the cardiac catheterization lab. We also compared the volume of cases for each month before and after the project. Data (Figure 5) clearly indicated case volume of the cardiac catheterization lab had not decreased over the time period during which the project was implemented.

Figure 2: Showing the day-to-day variation in the case volume in the cath lab before any change in the cardiologist block time.

Before Change

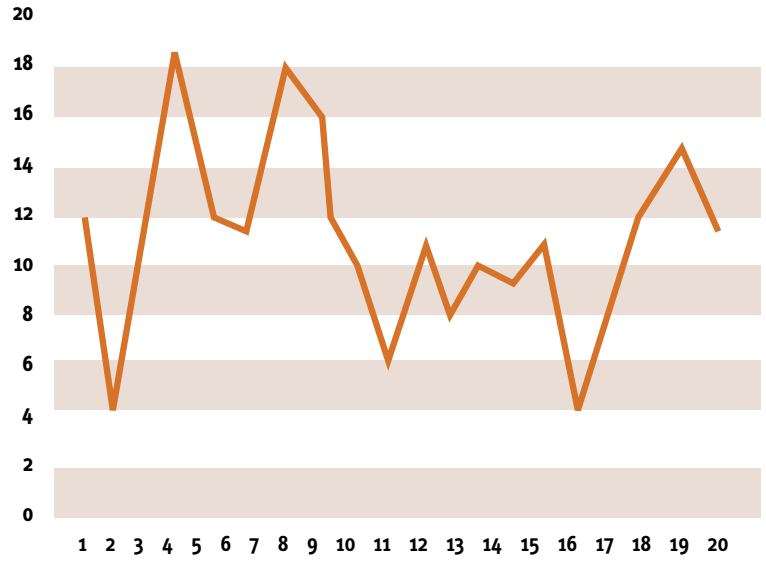
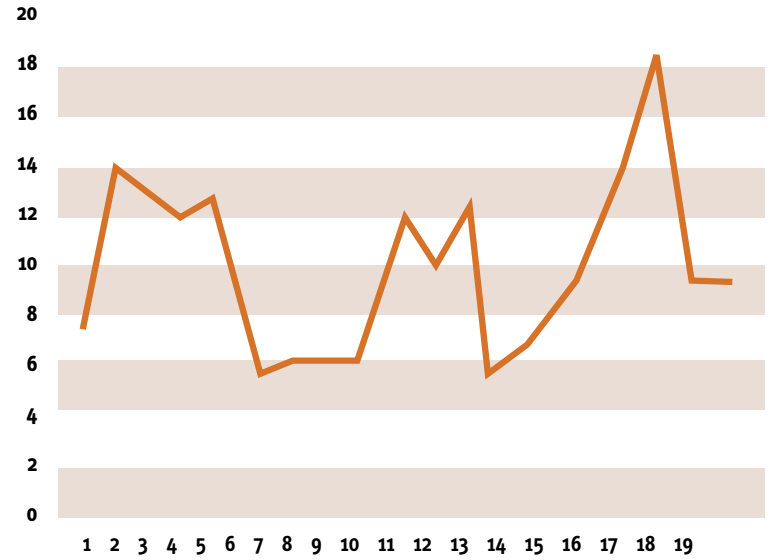


Figure 3: Showing the decrease in day-to-day variation in the case volume in the cath lab after change in the cardiologist block time.

After Change



Overall, our strategies for success included:

- Physician champion: This project necessitates physician support and the complete backing of the cardiac catheterization lab medical director. Cardiologists' willingness to move their block times is key for the process improvement.
- Management support: It may be necessary to allocate resources, especially when blocks are moved to a different day. (When we moved the cardiologist's block from Friday to Tuesday, there where issues in providing a Fellow and radiology tech to assist the cardiologist.)
- Team approach: Remember the famous quote, "There is no 'I' in team?" To harness the best of each individual, team members need to understand each other's strengths, roles, responsibilities, and the scope of the task.
- Evidence-based management: Data are critical for the project. Extensive analysis of the data enables management to make decisions to benefit cath lab operations.
- Continuous improvement: Sustainability is the most difficult part of a project. This challenge can be overcome by continuous improvement. These efforts can achieve "incremental" improvement over time or "breakthrough" improvement all at once.

As a result of this project, the hospital was able to decrease the cost of labor per patient by 23 percent, which will lead to a projected cost saving of $250,000 per year. Cardiologist support and involvement in the project was the single most important factor in the success of the project. This was accomplished by a team effort and applying operation management methodology to the process.

Figure 4: Decrease in cost of labor per patient from October 2009 to February 2010.

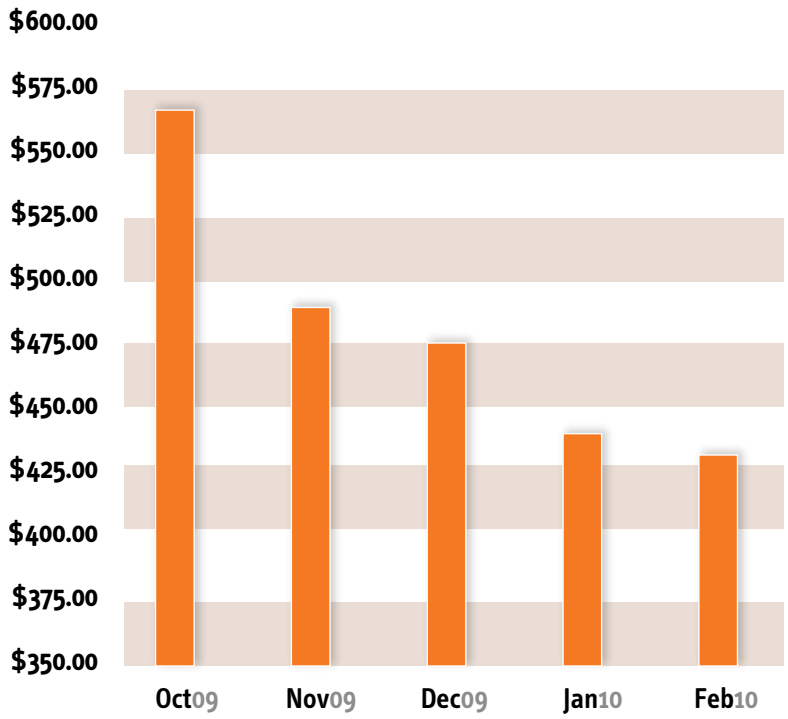
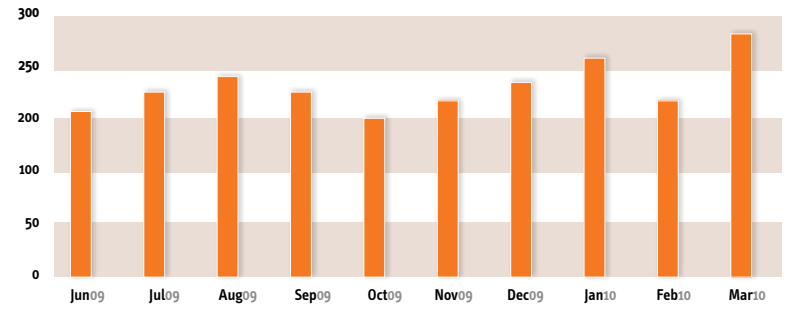


Figure 5: Average case volume between June 2009 and March 2010 remained the same.



Deephak Swaminath, MD, MBA, CSSBB(ASQ), is resident physician at Department of Internal Medicine, Texas Tech University Health Sciences Center, Lubbock, Texas.

deephak_swaminath@yahoo.co.in

Ashwani Kumar, MD, is assistant professor in the Department of Internal Medicine, Divisiion of Cardiology at Texas Tech University Health Sciences Center in Lubbock, Texas.

ashwani.kumar@ttuhsc.edu

Acknowledgments

The authors would like to thank the following people for their help with this manuscript. Leigh Ann Jenkins, MD-chief of cardiology, Ashwani Kumar, MD-medical director cath lab, Mark Funderburk, MBA, chief operating officer, Tim Howell MSN, senior vice president, Margarita B. Hart BSN, RN, director cath lab, Roger Williams, nurse in charge, outpatient cardiac center, Jeffrey Mize, radiology technologist

Reference:

1. AHA analysis of American Hospital Association Annual Survey data, 2004-2008, for community hospitals; Center for Medicare and Medicaid Services, office of the actuary.
2. Litvak E. *Managing Patient Flow in Hospitals: Strategies and Solutions*, Second Edition; Beurhaus P, Rudolph M, Prenney B, Fuda KK, Green Vaswani S, Long M, and others; Joint Commission Resources, 2009.