Maximizing Operational Capacity of Cardiac Interventional Rooms

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Abstract

Background: The cardiac interventional rooms had reached full operational capacity and were not able to accommodate projected growth for Cardiovascular Services. In 2015 Electrophysiology Lab (EP) utilization was 96% and Cardiac Catheterization Lab (CCL) utilization was 86%.

Methods: An analysis was completed which included: volumes, ancillary departments, current scheduling, and staffing. It was identified that extending the hours in the cardiac interventional rooms to 12 hours per day, Monday thru Friday, would achieve an incremental 50 hours per week in CCL/EP. To accommodate the extended hours in CCL/EP it was also necessary to extend the hours of the Prep/Recovery Room.

The proposal required 9.7 full-time equivalents (FTE) (Registered Nurse and Radiology Technicians) to fully operationalize the extended hours for the CCL/EP and Prep/Recovery. The FTE were granted in July 2016. The extended hours went live in February 2017.

Results: 50 incremental hours were added to the Cardiac Interventional room availability each week. Interventional Cardiology Relative Value Units (RVU) increased 51.4%, Patient Volumes increased 4.7%, EP RVUs increased 4.6%, and patient volumes increased 3.1%. EP utilization went from 96% to 70%. CCL utilization went from 86% to 60%. Turnaround Time decreased in all procedure rooms: CCL1 36 minutes to 25 minutes, CCL2 26 minutes to 16 minutes, EP 34 minutes to 32 minutes. We have seen a decrease in on-time starts for all services (Interventional, EP, and Heart Failure).

Conclusions: 50 incremental hours available in the lab has allowed for future growth. Increased patient volumes were recognized. Decreased utilization of the cardiac interventional rooms due to the additional available time has led to improved throughput as identified by the decreased turnaround time. Patients are scheduled for their procedures in a timelier manner. The nursing staff has also been able to implement several quality improvement initiatives due to the increased staff availability. Additional opportunity exists to improve on-time starts. Block assignments will be modified in 2018 to continue to maximize utilization of procedural rooms.

Clinical Implications: Consider alternatives to additional infrastructure and capital expenditures when faced with maximized operational capacity.

Objective

We aimed to identify an innovative solution to increase capacity in three cardiac interventional rooms to allow for future growth of the clinical practice.

Background

The CCL/EP had reached maximum operational capacity. EP utilization was at 96% and CCL utilization was at 86% in 2015. This resulted in an inability to schedule patients in a timely manner for their procedures. We also recognized an increase in the complexity of cases being scheduled in the CCL/EP which further reduced our ability to see additional patients. This was coupled with a market analysis indicating a tremendous opportunity for future growth in EP and Interventional Cardiology.

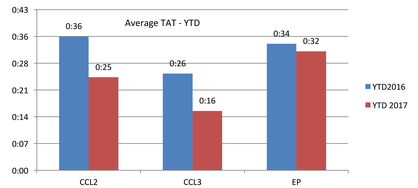
Methods

- The CCL/EP was charged with identifying options for extended hours of operation. Options included: opening on Saturdays versus extending the hours of CCL/EP to 12 hours per day/5 days/week.
- Opening the CCL/EP on Saturdays would require the addition of Anesthesiology and other ancillary departments while achieving limited incremental capacity.
- Extending the CCL/EP to 12 hours per day/5 days/week added 50 incremental hours each week in CCL/EP.
- The 12 hour shifts also created the ability to schedule more complex cases back to back.
- The Prep/Recovery Room hours were also extended to accommodate the extended hours in CCL/EP.
- The proposal required 9.7 RN/RT/RCIS/RCES. The minimum optimal staffing for diagnostic and interventional cardiovascular procedures include the staffing of three primary roles: hemodynamic monitoring/ documenting, circulating, and scrubbing. Unstable patients, or complex interventional procedures involving multiple technologies may require additional staff.[1]
- The FTE were granted in July 2016 and the extended hours went live in February 2017.

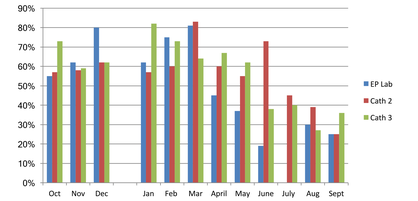
Results: Procedure Volumes

	2016 Sept YTD	2017 Sept YTD	% Change
Interventional Cardiology Division			
RVU	31,748	48,074	51.4%
Procedural Volumes (CCL)**	2474	2546	3%
Patient Volumes (CCL)**	1715	1795	4.7%
**includes CHF procedures in CCL			
Heart Rhythm Division (EP)			
RVU	55,330	57,852	4.6%
Procedural Volumes (EP Lab)	994	967	(2.7)%
Patient Volumes (EP Lab)	610	629	3.1%
Total RVU/FTE	2888.2	2625.2	(9.1)%

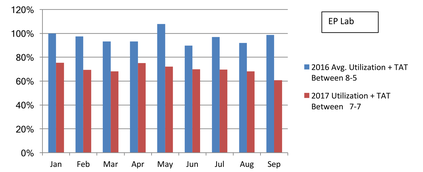
Turnaround Time

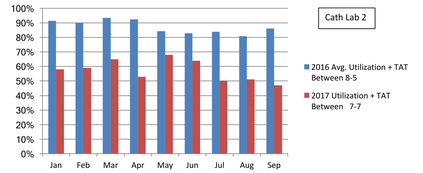


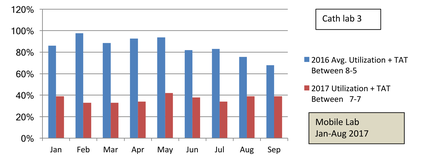
% On-Time Starts October 2016 – September 2017



Utilization
2016 0800 – 1700 vs 2017 0700 – 1900







2017 % Utilization of later hours: 1700 – 1900

Room	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
EP	53.7%	58.8%	35.5%	59%	53.4%	33.5%	60.2%	34.1%	27%
CCL 2	14.7%	27.8%	41.5%	17.6%	48.5%	25.4%	17.5%	20.3%	6.8%
CCL 3	0%	0%	2.4%	6.4%	2%	5%	5.3%	7.1%	14.3%

*CCL 3 was the mobile lab from January thru Aug 2017

Discussion

- A mobile cardiac catheterization lab was used for 8 months of 2017 due to equipment repair in CCL #3. This resulted in decreased efficiencies. 44 procedures had to be completed in Interventional Radiology during this time and are not reflected in these volumes.
- Decreased utilization of the CCL/EP has led to improved throughput as evidenced by the decrease in turnaround time.
- The complexity of patients for both EP and Interventional Cardiology has increased.
- Block allocation was adjusted in early 2018 as a result of the review of these metrics to improve utilization and on-time starts.
- December 2017 and January 2018 have the highest patient and procedure volumes for our organization in CCL/EP.
- The additional nursing staff has resulted in several quality improvement initiatives to improve patient safety and experience.
- Transitioning RN/RT staff to 12 hours shifts was initially challenging but has been overall successful in the department.
- Staff concerns regarding shift length in relation to on-call and call-back were addressed by providing minimum rest periods.
- RVU/FTE decreased by 9.1% due to on-boarding of new staff.
- 12 hour shifts in the CCL/EP increased resource requirements for other departments such as Anesthesia. Communication is essential in the initial planning stages to ensure all stakeholders are able to support the practice change.

Conclusions

- Increased operational capacity was successfully completed without incremental infrastructure or capital expenditures.
- Additional personnel was essential in our success. Efforts must be made to ensure adequate training of these additional team members when such a large volume of new staff are added in a limited time period.

References

1. The Society of Invasive Cardiovascular Professionals, Position Statement – Staffing in the Cardiac Catheterization and EP Lab, 2010

Disclosure: The authors have no relevant financial or nonfinancial relationships to disclose in relation to the information in this presentation.