



Optimizing Radiology Ablation Access Through Utilization of a Predictive Scheduling Matrix

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DEFINE

TEAM MEMBERS

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BACKGROUND

The Radiology Body Ablation practice was scheduling all patients in 240-minute procedure slots and at standard arrival times, neither of which were derived from historical procedure case data.

GAP IN QUALITY

The team identified the main gap in quality as extended patient lead times which were leading to the inability to accommodate additional patient access needs.

AIM STATEMENT

Reduce patient lead time from check-in to begin exam from 113 minutes to 80 minutes, by April 1st, 2022, without negatively impacting the rate of reported patient safety events occurring in the body ablation practice.

STAKEHOLDERS AND THEIR INPUT

List of stakeholders: Ablation radiology technologists, ablation nurses, radiologists, anesthesiologists/CRNAs, ablation schedulers, ablation sonographers, operational leaders

Key stakeholder input:

- Concern that ablation procedure case lengths cannot be predicted and standardized
- Concern that adding additional cases would extend the workday for Radiology ablation staff
- Apprehension surrounding the idea of a standard scheduling template; feeling that it would be inaccurate, further exacerbating the issue of patient lead time

INSTITUTIONAL SIGNIFICANCE

This project exemplifies that a practice with highly variable procedure durations can benefit from utilizing a predictive scheduling matrix.

Improved availability to schedule CT ablation procedures could result in improved patient outcomes and/or patient experience.

The resulting decrease in lead time has allowed additional access for patients needing ablation procedures and reducing patients' overall time spent in Radiology. This is a huge win for Radiology, but similar methodologies and thought process could be applied to many different clinical practices.

MEASURE

IMPROVEMENT MEASURE BASELINE AND SAMPLE SIZE

The baseline lead time was 113 minutes; this was captured from a sample of 714 procedures.

BALANCING MEASURE BASELINE AND SAMPLE SIZE

The team selected patient safety events as the balancing measure for this project. The sample size was again 714 procedures. The baseline measurement was 4 patient safety events.

DATA COLLECTION PLAN FOR IMPROVEMENT AND BALANCING MEASURES

Baseline lead time and safety event data were collected via departmental administrative data and exam events from the Electronic Health Record (EHR).

ANALYZE

KEY CAUSE SELECTED

- No way to determine appropriate procedure length for scheduling
 - All procedures scheduled for 270, procedure duration was found to vary from 125 to 193 minutes.
- No way to determine appropriate patient arrival time
 - All patients scheduled to arrive 90 minutes prior to procedure time.
- Misutilization of resources
 - Patients waiting in pre-procedural area due to protracted lead times.

OTHER POTENTIAL CAUSES

- No standard work for scheduling process

IMPROVE

INTERVENTIONS SELECTED AND TESTED

The causes of protracted lead times were complex. The team discovered through root cause analysis that much of the lead time was due to inappropriate scheduling.

- The scheduled procedure duration for body ablation patients was standard but not data driven. Therefore, during the improve phase the team sought to create a scheduling matrix based on historical data; in order to be able to better predict procedure durations when scheduling.
- It was also noted that patients were asked to arrive 90 minutes prior to their appointment time. Patients were often ready and waiting for the procedure team.
 - The team's first PDSA was to reduce the arrival time to 60 minutes prior to procedure time. This helped to decrease lead time and as such, was adopted into the practice.

COMPARISON FOR THE IMPROVEMENT MEASURE

Lead time decreased from 113 minutes to 76 minutes.

COMPARISON FOR THE BALANCING MEASURE

The balancing measure of patient safety reports related to body ablation patients saw a decrease, from 4 events in the pre-intervention measurement timeframe to 2 events in the post-intervention timeframe.

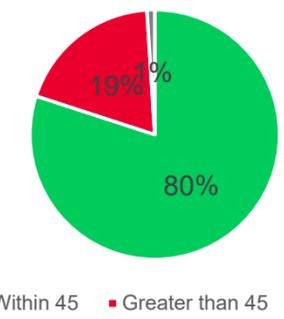
TABLE 1: SCHEDULING MATRIX

		# of sites							Bilat.	
		1	2	3	3+	4	4+	5		
L o c a t i o n	Abdominal Area	180	210							
	Adrenals	180	270							
	Chest Area	180	210							
	Extremities	120	210							
	Kidneys	150	210	300		330				270
	Livers	120	180	210			300			
	Lungs	150	180	210		210			270	
	Thyroid	90								120
	Pelvis Area	180								
		# of Minutes								

Analysis of historical case data and procedure durations led the team to test several versions of a scheduling matrix. With additional time came additional data and the team was able to improve the specificity of the matrix. This is the most recent iteration.

FIGURE 1: MATRIX RESULTS

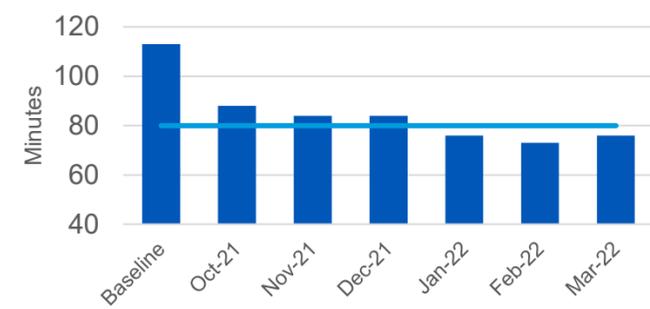
Ablation Scheduling Matrix Results



The goal of this PDSA was to be able to accurately predict procedure length, with a 45-minute margin for error, 80% of the time. The final matrix was tested over six months with 333 procedures and met the goal of 80%.

FIGURE 2: IMPROVEMENT

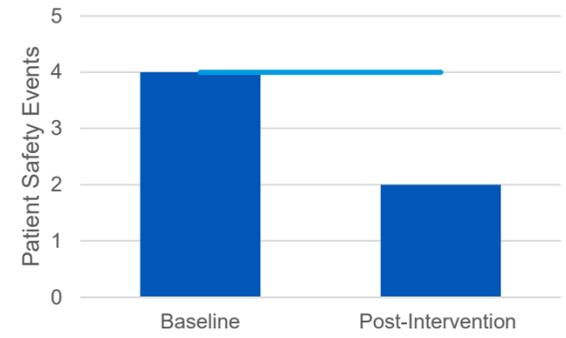
Patient Lead Time: Check-In to Begin Exam
Goal: 80 min or less



Over the course of the Improve Phase the team saw a decrease in patient lead time from the baseline of 113 minutes to 76 minutes in final month of testing.

FIGURE 3: BALANCING MEASURE

Improve Phase: Patient Safety Events



The team monitored patient safety events prior to and after the Improve Phase. There were 4 patient safety events related to body ablation patients in the seven months prior to testing any changes and 2 patient safety events in an equal measurement period post-intervention.

CONTROL

LESSONS LEARNED

Although it is often thought that patient care cannot be standardized and, in this case, procedure durations cannot be predicted; with the help of a little data, it is possible.

COMMUNICATION

Project progress was communicated with project sponsors on a monthly basis via discussion of project related metrics, such as: patient lead time, on-time starts, and matrix accuracy.

A wrap-up discussion to outline final interventions and improvements was facilitated.

HAND-OFF PLAN

The results of the project and monitoring plan for project related metrics were handed-off to the operational team.

The team plans to continue working on the predictive scheduling matrix in order to improve accuracy above 80%. Additional work is already being done to better understand the accuracy of each procedure type and test additional modifications.

MONITORING PLAN

Lead time will continue to be monitored on a monthly basis by the operational team. The team will also continue to monitor the accuracy of the Ablation Scheduling Matrix. If lead time rises above the goal of 80% or accuracy of the matrix (within 45 minutes) falls below 75% the team will come back together to understand why and plan next-steps.