

# Robert Wood Johnson

Robert Wood Johnson University Hospital  
Improves OR Throughput and Reduces Costs



## CHALLENGES

Robert Wood Johnson University Hospital anticipated a significant increase in patient volume for their OR suite. As a major source of revenue for the hospital, the leadership team needed to make sure the OR suite was as efficient as possible while also minimizing costs.

Due to the highly variable nature of work flow in the OR and the expenses involved in managing the projected increase of volume, as well as the introduction of case carts into the OR system, leadership requested that an objective data driven analysis be conducted in order to assure optimal performance of the OR suite.

## SOLUTION

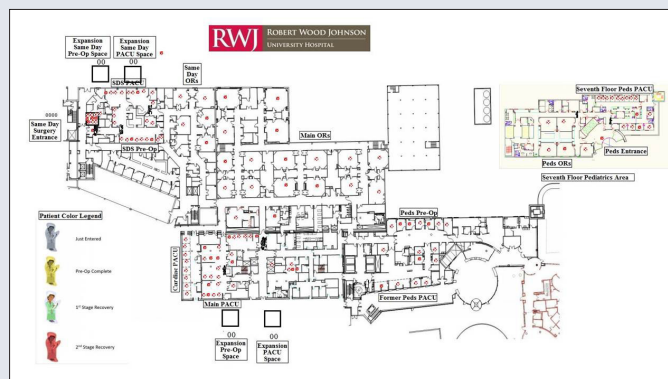
The leadership team for the OR needed to understand the overall constraints on throughput in the OR Suite, as well as the cycle time for patients flowing through the system. Where patient flow problems existed, managers needed to determine if they were being caused by a lack of space or insufficient staff. The team was tasked with determining whether the OR suite could accommodate a 30% increase in patient volume without changing the OR's physical environment or adding additional space. Additionally, case carts were being introduced into the system and the team needed to make sure that the carts were properly resourced to keep up with patient flow through the OR.

To deal with the effects of high variability in the OR it was decided that a simulation solution was the only way to reliably predict the impact of changes to the work and/or workflow. The leadership team conducted a simulation analysis of workflow by building a process simulation model in MedModel validating and verifying it against historical data. This also allowed them to determine which patient types were most disruptive to a smooth flow through the OR suite and to engineer methods which would mitigate or eliminate these effects.

Particular attention was paid to the two patient recovery (PACU) areas in the OR System, the

## OBJECTIVES

To increase throughput while optimizing staff and plan for the necessary actions required to further accommodate a rise in patient volume.



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Main PACU and Cardiac PACU. Expansion areas were also added to the model to help understand if they could potentially add capacity and improve patient flow through the OR, or if they were sources of further constraint to the system.

The model was also designed to be fully costed, incorporating financial elements and reporting on

how much profit is generated with each patient flow scenario.

The output data of the model allowed the leadership team at RWJUH to design an optimal workflow process that consisted of adjusting their staffing levels to ensure maximum throughput with minimum patient delay and at minimum cost.

## Value Provided

The solution informed the RWJUH OR staff about their own process in a way no other approach could have. They learned which patient types and surgery types caused the most disruption in flow and the length of OR hold times by patient type. In particular, the model indicated that the PACU areas were the major limiting factor and constraint to OR flow.

The OR suite simulation output significantly affected their decision making process and was used to determine which actions they needed to take regarding the PACU areas. After implementing the model into their decision making process, no action was taken that was not first verified effective by the solution. For example, it was

determined that case carts could be successfully introduced to the system; however the data indicated that the single case cart washers were a critical point in the system to be monitored in the future.

Ultimately, the leadership team at RWJUH was able to increase their throughput while reducing staff and plan for the necessary actions required to accommodate further volume increases. The model was built to be an extremely flexible model to be used over the long term. It has been used over the course of 2 years to investigate a series of different improvements to the OR suite to improve both patient experience and hospital operations.