

University Hospital Pediatric Ophthalmology Unit Optimization

Ophthalmology Unit
Optimization

Success Story

Healthcare

Process Simulator



CHALLENGES

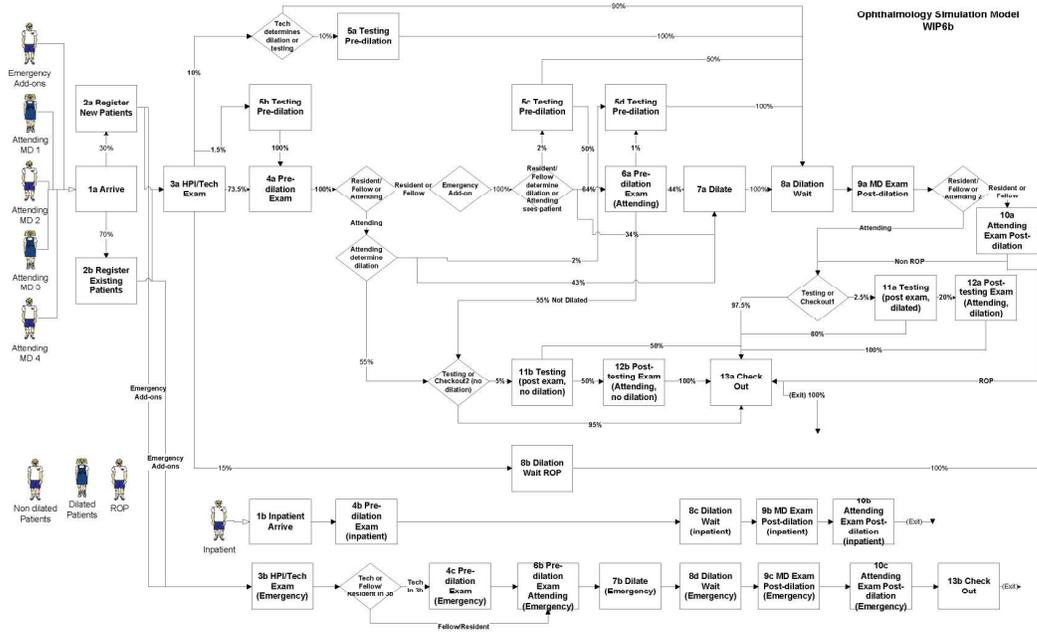
A prominent academic children's hospital, located in the heart of a large city, must continually manage increased patient volumes against space, equipment and resource constraints. The pediatric ophthalmology clinic was experiencing increased visit length and a backlog in available appointments. They use a block of 11 exam rooms surrounded by other clinics that are fully occupied.

The ophthalmology clinic staff believed that to solve the visit length and access issues, they needed additional exam rooms and personnel. To help them determine if this was required and to find other possible solutions to their space and resource issues, the hospital's quality improvement group became involved.

OBJECTIVES

Determine if the ophthalmology clinic needed additional exam rooms, technicians or doctors to help reduce visit length and session time.

- Determine if they needed an expanded waiting room
- Determine what other factors would positively affect the patient flow



SOLUTION

The model revealed that additional exam rooms and more support staff would have no significant impact on reducing patient visit length or appointment availability. As stated by one of the clinic’s attending physicians, “We had some real surprises in our results which changed how we thought about our patient flow; we discovered the limiting factors to develop effective solutions for improvement.”

The model data revealed that adding an attending physician to see patients within a disease-specific subspecialty (“ROP clinic” in the table below) would provide the largest impact, without requiring additional exam room space or support staff. As shown in the table, this change would:

- Decrease patient length of stay
- Reduce session length
- Improve access for all patients
- Increase ease in scheduling
- Reduce backlog of patients without impacting patient flow and session length

VALUE PROVIDED

The quality improvement group implements operations improvements using a variety of tools including simulation. Using ProModel’s Process Simulator and Six Sigma tools, they built a model in less than three months that represented the clinic as a sequence of processes and took into account the variation in cycle time. The quality improvement group worked with the Division Chief, an Attending MD, the Administrative Director, and a clinic technician to build the base model and analysis scenarios. The following metrics were generated:

	Current State Model	Add Resources	Add Resources with 10% Growth in Visits	ROP Clinic	ROP Clinic with 10% Growth in Visits	
Inputs	Total Patients	62	62	68	69	
	Dilated	30	29	32	30	
	Non-dilated	17	18	19	21	
	ROP	9	9	9	10	
	Inpatients	3	3	3	3	
	Emergency/Add-ons	3	3	5	5	
	Exam Rooms, Pediatric Ophthalmology Attendings	5	6	6	4	
	Exam Rooms, ROP Attending	NA	NA	NA	3	
	Techs	4	5	5	4	
	Resident/Fellows	3	4	4	3	
Metrics	Length of Stay (min, avg, max in minutes)					
	Time in System: Dilated	83, 121, 171	86, 118, 165	85, 124, 178.5	84, 114, 154	84, 119, 161
	Time in System: Non-dilated	28, 46.5, 84	28.5, 47, 86	28, 50, 91	29, 44, 73	29, 45, 76
	Time in System: ROP	85, 100, 120	84, 101, 121	86.5, 101, 120	82, 100, 119	83, 106, 140
	Time in System: Inpatient	70, 78, 85	69, 76, 83	71, 78, 85	70, 76, 82	71, 77, 82
	Time in System: Emergency/Add-on	105, 116, 128	103, 111, 118	102, 114, 127	104, 112, 120	101, 115, 129
	Patients in Waiting Room - Maximum #	8	7.5	9	8	9
	Session Length (clock time last patient exited)	6:03pm	5:50pm	6:04pm	5:33pm	5:47pm
	Utilization*					
	Exam Room utilization: Attending 1	64.8%	56.0%	61.0%	55.2%	62.0%
	Exam Room utilization: Attending 2	51.9%	44.0%	50.0%	47.7%	54.0%
	Exam Room utilization: ROP Attending	NA	NA	NA	55.2%	56.2%
	Tech utilization: 1	69.4%	69.3%	72.0%	70.5%	73.3%
	Tech utilization: 2	31.4%	18.6%	22.0%	36.5%	44.0%
	Tech utilization: 3	31.6%	19.0%	22.0%	36.8%	43.6%
Tech utilization: 4	52.5%	38.2%	350.0%	53.6%	55.5%	
Tech utilization: 5	NA	38.3%	41.0%	NA	NA	

- Number of completed patients
- Patient visit length
- Number of patients in waiting room
- Session Length, or when did first patient arrive and last patient leave
- Resources utilized

The following scenarios were evaluated:

- Varying number of exam rooms
- Varying number of technicians
- Varying number of residents or fellows
- Increased session length
- 10% growth in patient volume

Division Chief, “We were able to look at resource usage analytically and objectively in order to plan for strategic.