

Boston Scientific

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Cath lab Workflow Webinar

Audio

The screenshot shows the 'Audio' settings panel. At the top, there are three tabs: 'Audio' (selected), 'Screen', and 'Webcam'. Below the tabs, there are three radio button options: 'Computer audio' (selected), 'Phone call', and 'Phone call'. The 'Computer audio' option has a 'Sound Check' link next to it. Below the radio buttons, there are two volume sliders. The first slider is for the microphone, with a green bar indicating the current level. The second slider is for the speakers/headphones. Below each slider is a dropdown menu showing the selected device: 'Microphone Array (IDT High Defini...)' and 'Speakers / Headphones (IDT High ...)' respectively. There are also three dots and a question mark icon in the top right corner of the panel.

Q & A

The screenshot shows the 'Q & A' chat interface. At the top, there is a dark grey header with a dropdown arrow and the text 'Chat'. Below the header, there is a light grey chat area with a dropdown arrow and a question mark icon in the top right corner. In the center of the chat area, there is a message box with the text 'Me' on the left, '17:15' on the right, and 'testing 1..2... testing' in the middle. At the bottom of the chat area, there is a 'To:' dropdown menu set to 'Everyone' and a 'Send' button.

Recording will be available on SIMUL8Healthcare.com



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Boston Scientific

- Introduction
- Project Overview
- Samples of Simulation-Based Scenario Analysis
- Samples of Key Results
- Summary
- Q&As

- Treats 55,000 patients per year
- Largest inherited arrhythmia clinical and resource program in Canada
- Leading more than 20 international trials, involving 30,000 patients and 400 physicians, scientist and researcher in 20 countries
- Working closely with Mayo on a trial of genomics (coronary disease)
- Partnering with the banting and best diabetes center
- Progressive adoptions of 3D echocardiography to establish the first Canadian anesthesiology cardiovascular imaging center
- 1M to “pioneers” through a ‘dragon’s den’ innovation committee

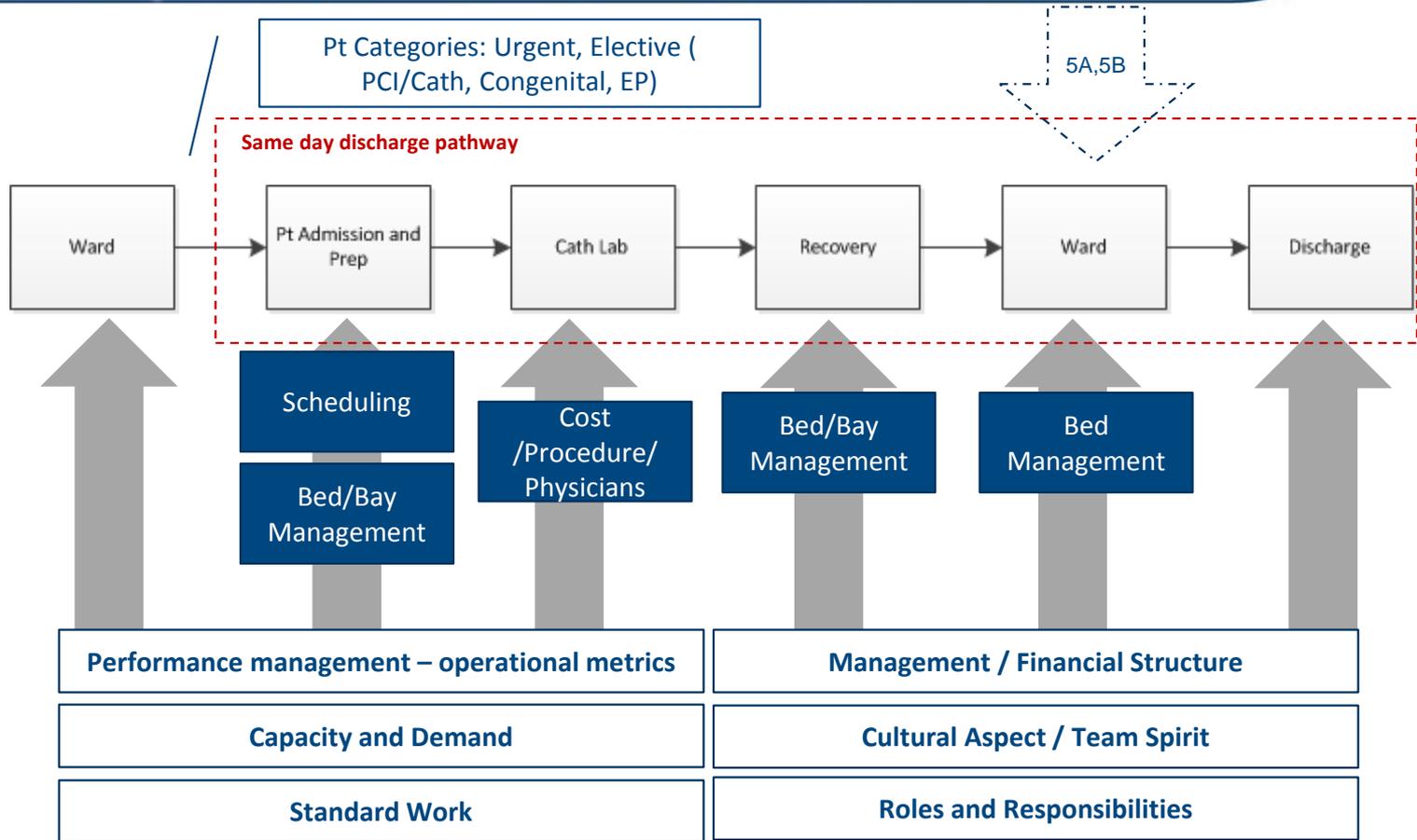


Catheterization laboratory (Cath lab) general info:

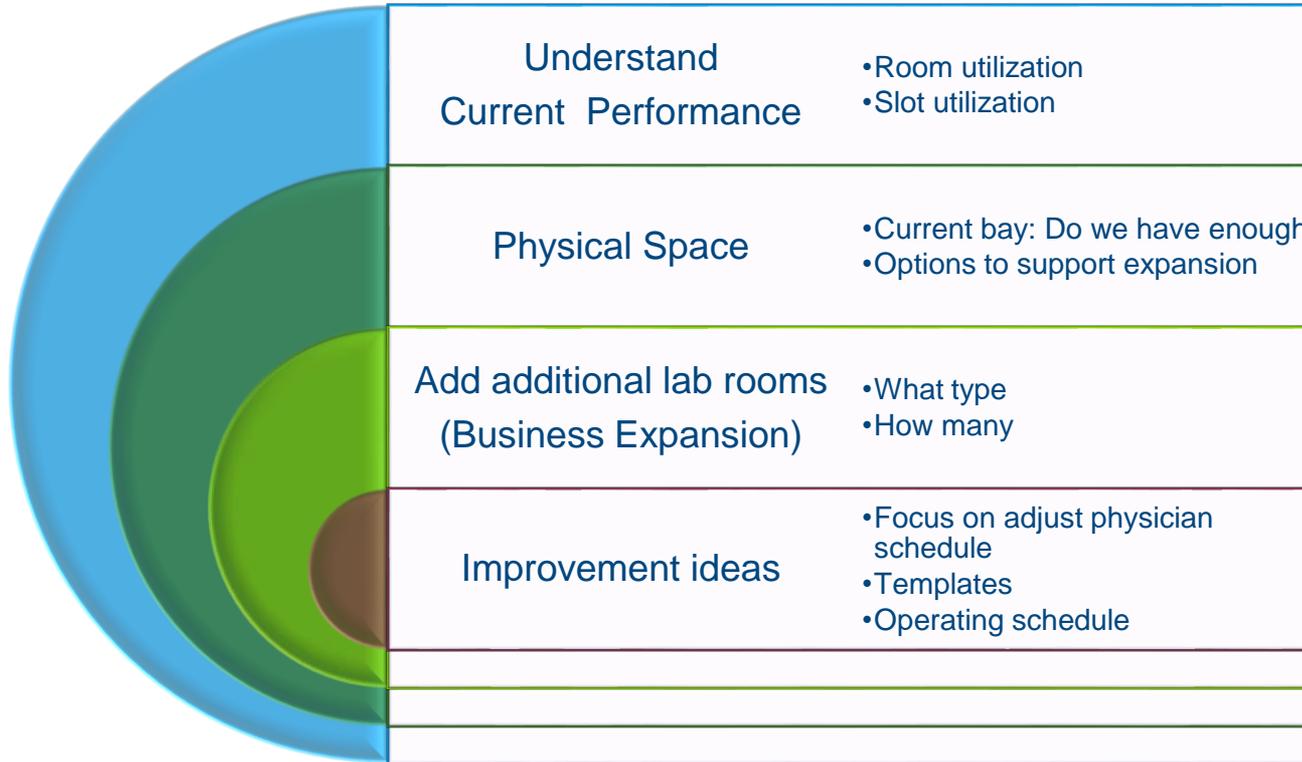
- No. of Labs: 4.
 - 2 Percutaneous Coronary Intervention(PCIs) , 1 Structural Heart and 1 Electrophysiology Procedure(EP)
- No. of prep and recovery bay beds: 14
- Operating hours:
 - Bay : 7:00 to 18:00
 - Labs: 8:00 to 17:30
- Resource ratio:
 - Labs: non congenital cases: 3:1 . Congenital cases: 4:1
 - Prep: 4-5:1 and 1:1 the hour after procedure (during recovery)
 - Attendants (housekeeping and transportation): 3

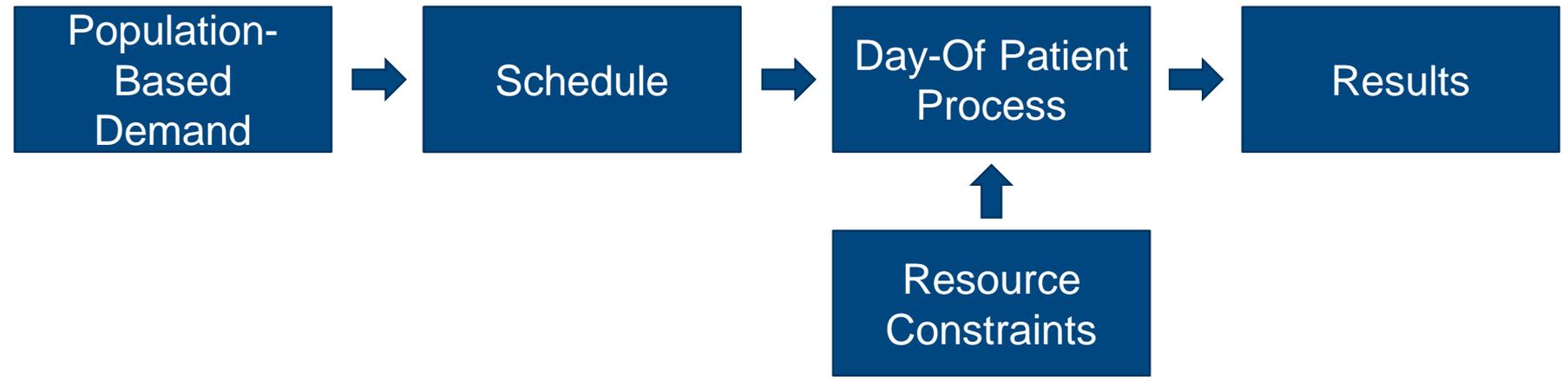
Current State /
Baseline model

Process Scope



Simulation-Based Scenario Analysis





- **Process Details**

- Activity description
- Who performs the activity (ex. pre-op nurse)
- How long the activity takes (in minutes)
- Where the activity is performed (ex. pre-op bed)
- Delay or transportation times between each activity

- **Patient Demand**

- Daily patient schedule
- Types of procedures
- Level of patient demand, by procedure type and by status
- How long each procedure type takes

- **Resource Constraints**

- Which clinical staff perform each procedure type
- List of all staff involved in the Cath Lab operation
- How many of each type of staff are available, by shift and/or day of week
- Percentage of time each staff member spends on non-patient-touch activities

- The simulation is built to reflect layout as well as process.



Many detailed results are collected, including:

- Patient delays
- Schedule backlog
- Schedule/slot utilization
- Resource utilization
- Room and bay Occupancy



Scenario Themes:

1. Base Case – Current State
2. Additional Specialty Volume Growth
3. Transfer of some O.R.-based Cases
4. Add 2 rooms into the current state (Merge 2 sites into 1)

#	Demand Level	# Labs	Labs Mix	Lab Hours	Bay Hours	Reschedules	Overnights	Highlights
1	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low (except lab 4) Elective PCI slot is underutilized Biopsy requires more slots to accommodate current demand Management request: expand pacemaker volume and congenital slots
2	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
3	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
4	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
5	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
6	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
7	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
8	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
9	TGH funded + 2% for unfunded services	4	current schedule	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
10	TGH funded + 2% for unfunded services + pacemaker from O.R.	4	More Expansion	8:00-20:00	7:00-22:00	19:00	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
11	Possible Future (max last year or planned)	4	Additional Pacemaker Day	8:00-20:00	7:00-22:00	19:00	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots
12	Possible Future (max last year or planned)	4	Max Expansion	8:00-20:00	7:00-22:00	19:00	No	<ul style="list-style-type: none"> Room utilization is low Biopsy demands are accommodated Management request: expand pacemaker volume and congenital slots

Variables for scenarios

- Demand level
- No. of labs
- Lab mix
- Bay hours
- Reschedule cut offs
- Overnights

Scenario Examples

Scenario 5 vs. Scenario 10

#	Demand Level	# Labs	Labs Mix	Lab Hours	Bay Hours	Reschedules	Overnights	Highlights
5	System funded + 2% for unfunded services + pacemaker from O.R.	4	Additional pacemaker volume from O.R. 6 cases per week added) and additional congenital cases	8:00-18:00	7:00-18:00	16:30	No	<ul style="list-style-type: none"> Designed to accommodate the entire requested volume from O.R. without taking away any additional slots based on scenario 4 as physician engagement could become a concern Overall performance was the best out of the last 5 scenarios. This model achieved an avg. 68% room utilization among lab 1,2 & 3. (Max 76%, Min 60%) Slot utilization shows the best performance among the last 5 simulations as well. (benchmark slot utilization should be something approx. 70%, leave some space for urgent requests, reduce the waiting time etc.) Added additional 6 pacemaker slots by expand/add cases/slots based on utilization Still was able to add 2 congenital case per week Redesigned the schedule base on best estimation
10	System funded + 2% for unfunded services + pacemaker from O.R.	4	More Expansion	8:00-20:00	7:00-22:00	19:00	No	Add even more new slots. The wait list is eliminated and slot utilization is reasonable across the board.

Scheduling
Template

Hours of
Operation

Number of
Rooms/Bays

Overnight Stays

Cancellation
Policy

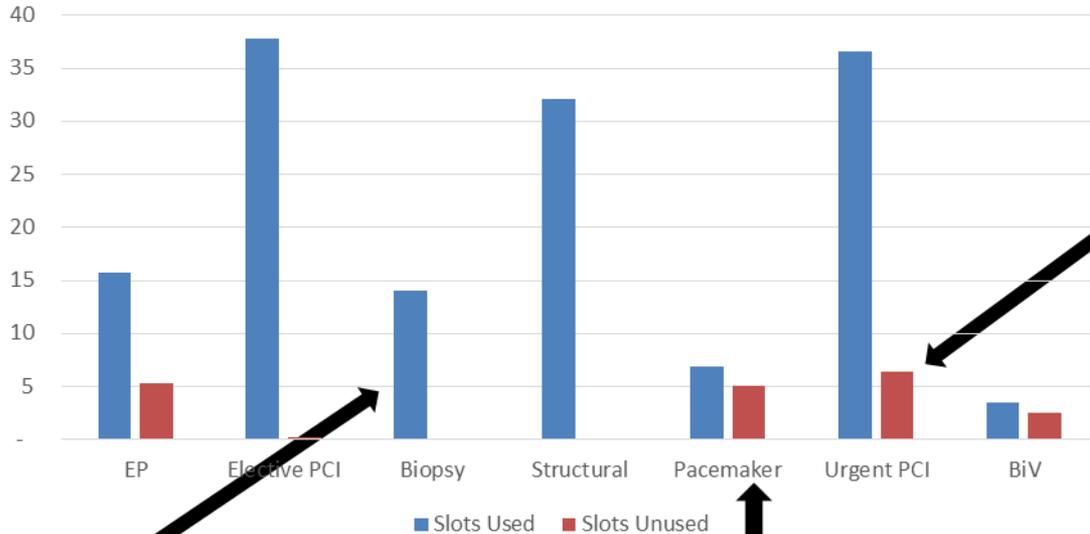
Demand Levels



Sample Results

Results: Slot Utilization by Type

Understand Current State



For urgent cases, need to maintain some flex capacity.

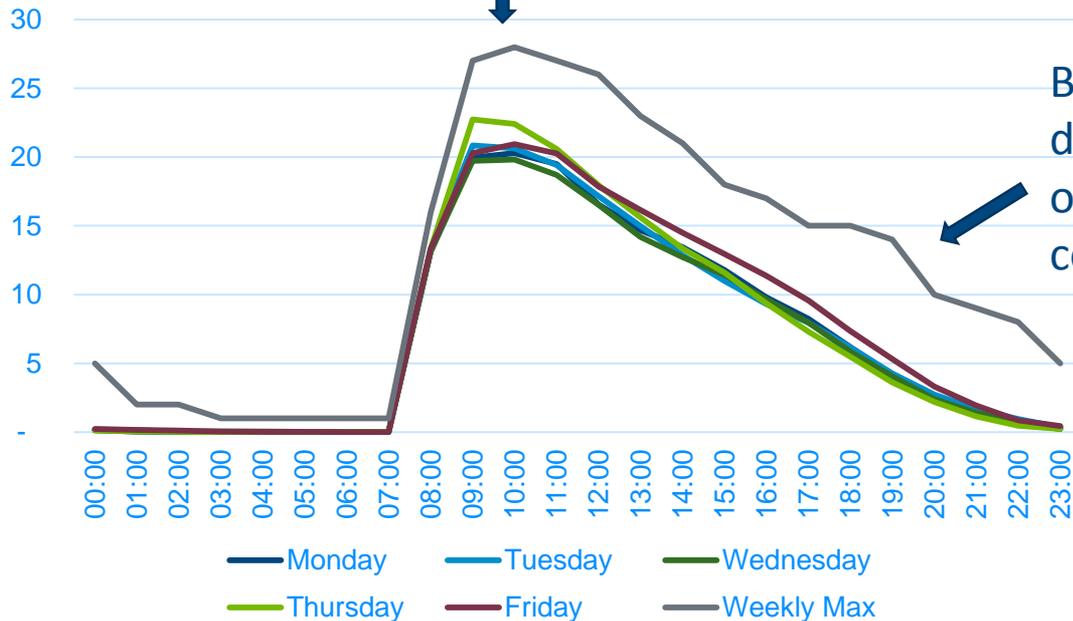
This specialty has 100% utilization, which means that the wait list is growing rapidly.

May be able to reclaim some of these slots for other specialties.

Results: Bay Occupancy

Understand Future State : bay capacity

If run unconstrained, the simulation shows that we could expect to need up to 28 bays if all 6 rooms are experiencing peak demand at the same time.

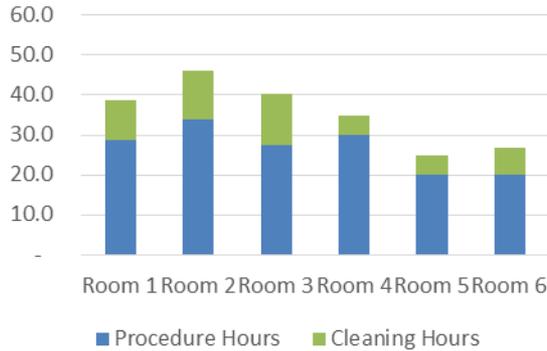


Bay occupancy drops quickly as the day progresses. There may be opportunity to reduce construction costs by reorganizing the schedule.

Results: Room Utilization per Week

Improvement ideas

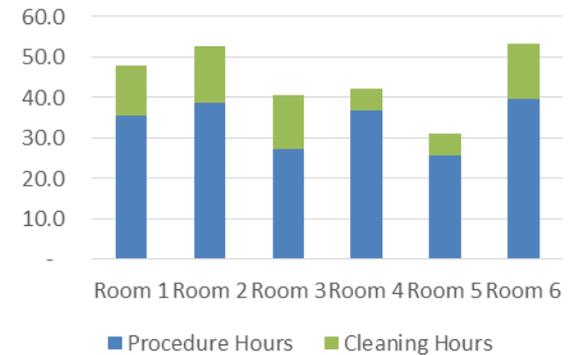
Combined Demand & Current Hours



Increased Demand & Current Hours



Increased Demand & Extended Hours

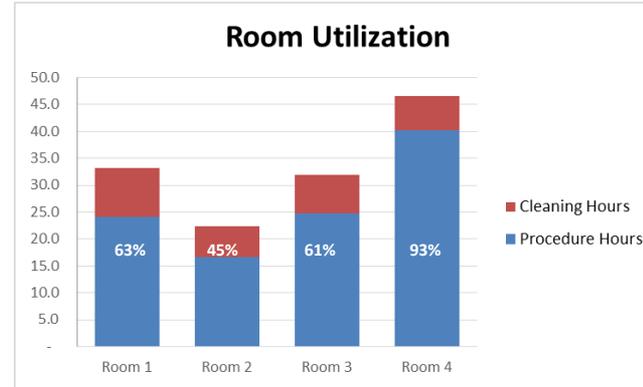


EP Rooms: Rooms 4 and 5
 PCI Rooms: Rooms 1, 2, and 3
 Structural Room: Room 6

Recommendations

Baseline Highlights

- Baseline model, current state, highlights
 - Room Utilization:
 - Average utilization among lab 1, lab 2 and lab 3 are only at 56%, lab 2 has the lowest annualized utilization 45%
 - Lab 4 is almost at capacity, running an annualized utilization at 97%
 - Slot Utilization
 - Biopsy needs to assign more slots
 - Elective PCI is well under utilized
 - Management team required to expand pacemaker and structural slots
 - Keep urgent PCI in order to manage the LOS expectation
- Based on the baseline performance, 12 scenarios were generated to improve utilizations by adjust physician schedules and lab/bay schedules, best option: Scenario 5.



	EP	Elective PCI	Biopsy	Structural	Pacemaker	Urgent PCI	STEMI	BiV
Monday	100.00%	31.15%	N/A	N/A	92.63%	66.92%	N/A	N/A
Tuesday	100.00%	21.47%	N/A	N/A	N/A	46.43%	N/A	82.69%
Wednesday	100.00%	37.98%	N/A	93.59%	N/A	78.85%	N/A	37.50%
Thursday	100.00%	31.73%	100.48%	N/A	98.08%	71.15%	N/A	N/A
Friday	100.00%	34.23%	N/A	70.39%	N/A	67.69%	N/A	N/A
Total	100.00%	30.61%	100.48%	79.09%	95.35%	63.30%	N/A	55.45%

	Under utilized slots
	Need to assign more slots
	Require to expand slots
	Don't change due to the need to meet LOS expectations

Summary Scheduling Template

Case schedule example before vs. after

Best recommendation for case schedule template:

Baseline

Room 1	Monday	Tuesday	Wednesday	Thursday	Friday
	2	2	2	3	2
	6	6	6	3	6
	2	2	2	3	2
	6	6	6	3	6
	6	6	6	2	6
				2	
				6	
Room 2	Monday	Tuesday	Wednesday	Thursday	Friday
	2	2	2	2	4
	6	6	2	6	4
	2	2	4	2	4
	2	6	4	6	4
	6	6	4	6	4
Room 3	Monday	Tuesday	Wednesday	Thursday	Friday
	5	8	8	5	2
	5	8	8	5	6
	5	2	8	5	2
	5	2	8	5	2
	5	6		5	6
	5			5	
Room 4	Monday	Tuesday	Wednesday	Thursday	Friday
	1	1	1	1	1
	1	1	1	1	1
	1	1	1	1	1

Best Solution

(Scenario 5)

Room 1	Monday	Tuesday	Wednesday	Thursday	Friday
	2	5	2	3	2
	2	5	2	3	2
	6	6	6	3	6
	6	6	6	3	6
	6	6	6	2	6
				2	
				6	
Room 2	Monday	Tuesday	Wednesday	Thursday	Friday
	3	6	4	5	4
	3	6	4	5	4
	3	6	4	6	4
	3	6	4	6	4
	3	6	4	6	4
		6			
Room 3	Monday	Tuesday	Wednesday	Thursday	Friday
	5	5	8	5	6
	5	5	8	5	6
	5	5	8	5	2
	5	5	8	5	2
	5	5	8	5	2
	5	5	8	5	2
			8	5	
Room 4	Monday	Tuesday	Wednesday	Thursday	Friday
	1	1	1	1	1
	1	1	1	1	1
	1	1	1	1	1

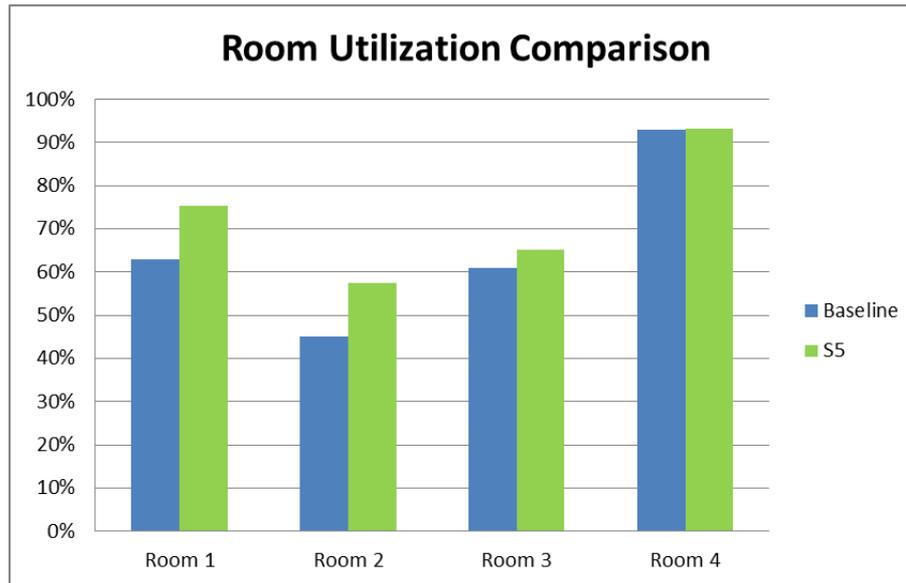
EP	1
Elective P	2
Biopsy	3
Structral	4
Pacemaker	5
Urgent PCI	6
STEMI	7
Biv	8

- Added 6 pacemaker slots. Per Week
- Added 2 congenital slots per week
- Took away some slots from Elective PCI

Summary Slot Utilization

Room Utilization before vs. after

Room Utilization comparison between base model (current state) vs. suggestion Scenario 5



- Ask the right questions
- Understand the variables
- Walk/see the process
- Collect Voice of Customer/Hospital
- Manage the scope closely
- Regular use of the software package





A recording of today's session will be available on SIMUL8Healthcare.com

Continue the discussion

Linked  TM
SIMUL8 in Health