

# **Modification of System Schedule Simulation Model Output Results**

## **GI Clinic Flow Project**

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# Proposed Tests of Change

- **Model Modifications**

- Increase general GI (NV and FU) patients by x% on all days
- ***Increase general GI (NV and FU) patients by x% on certain days with availability in schedule***
- Add provider on all days – general GI
- Add provider on certain days with availability in schedule – general GI
- Moving patients to nutrition room for nutrition or social work consult

- **Breaking Points**

- Clinic goes past 6:00pm
- Clinic goes past 1:00pm
- Waiting time longer than 40 minutes in waiting or exam room
- Touch time <60%

# Analysis Parameters

## Appointment Analysis

- Applied clinic schedule template / room assignments from November, 2010
- Identified clinic characteristics & appointment types from historic data (9/10 – 11/10)

## Assignment Approach

- Schedule low variability appointments early in clinic
- Schedule physicians for no more than 4 hours based on scheduled appt duration
- Adjust arrival times so that average touch time will fit into 4 hours clinic schedule
- Target volume increase 20-25% of historic average

# Output Statistics

**3 Month Baseline**

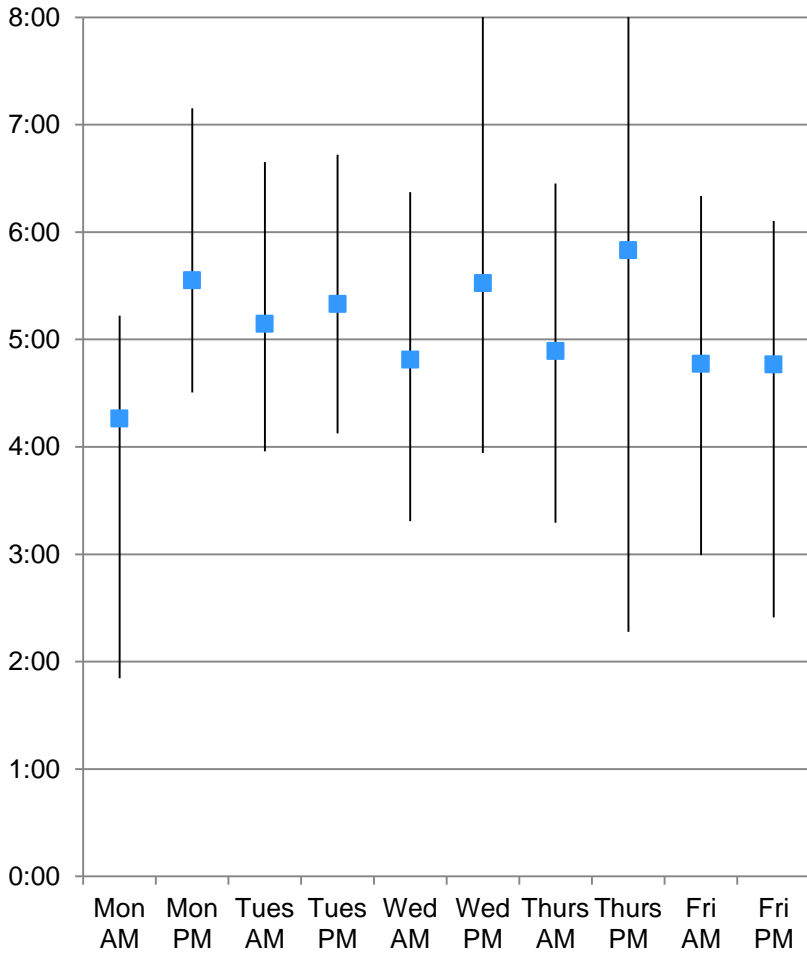
	N	Mean	Standard Dev	Minimum	Maximum	75%	90%
Cycle Time	7670	1:17	0:38	0:13	5:07	1:36	2:08
Waiting Room Wait	7670	0:08	0:18	0:00	2:42	0:05	0:33
Total Wait Time	7670	0:20	0:26	0:00	2:56	0:32	0:57
Registration	7670	0:02	0:01	0:00	0:17	0:02	0:03
Vitals	7670	0:05	0:04	0:01	0:20	0:07	0:12
MedRec	7670	0:04	0:02	0:00	0:20	0:05	0:07
Nurse Time	7015	0:16	0:13	0:00	1:49	0:22	0:35
Transplant Coordinator	873	0:27	0:24	0:03	1:58	0:59	1:20
Fellow	2079	0:25	0:12	0:02	1:11	0:34	0:43
Physician	7670	0:18	0:09	0:02	0:56	0:25	0:32
Dietician	1935	0:17	0:08	0:02	0:45	0:23	0:29
Social Work	351	0:28	0:15	0:09	1:00	0:36	0:56
Research	695	0:11	0:07	0:02	0:40	0:15	0:22

**New Schedule**

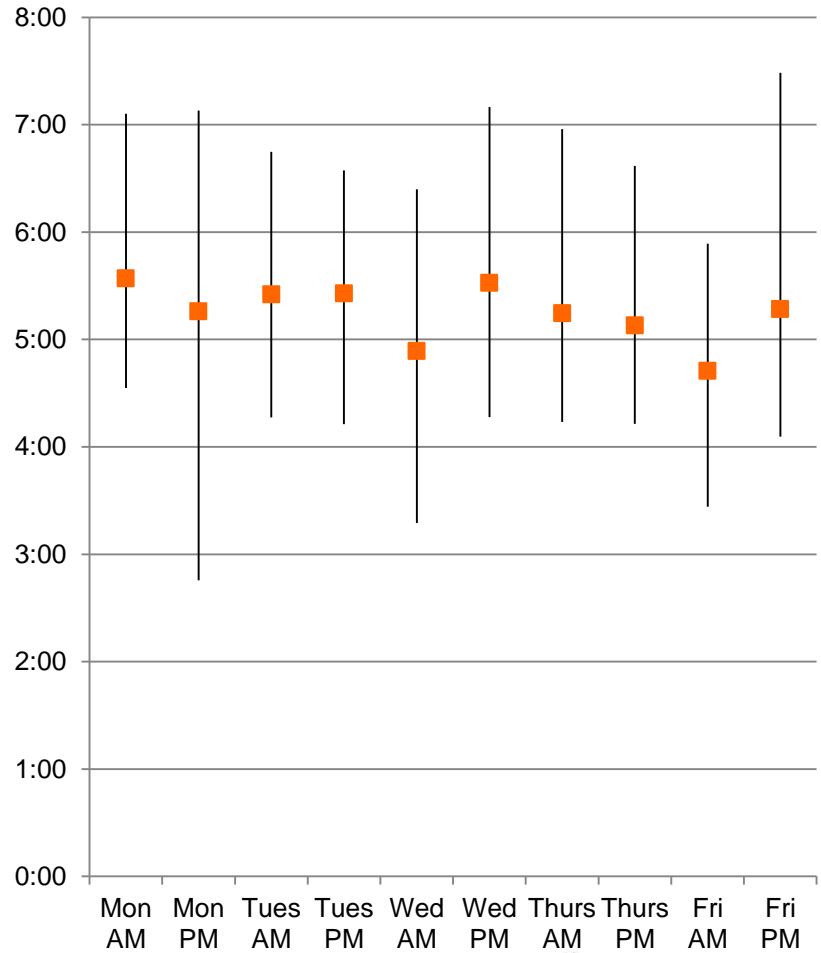
	N	Mean	Standard Dev	Minimum	Maximum	75%	90%
Cycle Time	10314	1:17	0:36	0:12	5:17	1:35	2:04
Waiting Room Wait	10314	0:09	0:17	0:00	2:50	0:09	0:34
Total Wait Time	10314	0:21	0:25	0:00	3:25	0:33	0:56
Registration	10314	0:02	0:01	0:00	0:21	0:02	0:03
Vitals	10314	0:07	0:05	0:01	0:19	0:11	0:15
MedRec	10314	0:04	0:02	0:00	0:21	0:05	0:07
Nurse Time	9399	0:15	0:12	0:00	1:38	0:20	0:33
Transplant Coordinator	968	0:40	0:23	0:01	1:53	0:54	1:15
Fellow	2744	0:26	0:13	0:01	1:16	0:36	0:46
Physician	10314	0:18	0:09	0:02	1:01	0:24	0:32
Dietician	2417	0:17	0:08	0:02	0:47	0:22	0:28
Social Work	362	0:27	0:15	0:09	1:00	0:38	0:53
Research	1023	0:11	0:07	0:02	0:41	0:15	0:22

# Clinic Duration

## Baseline Simulation

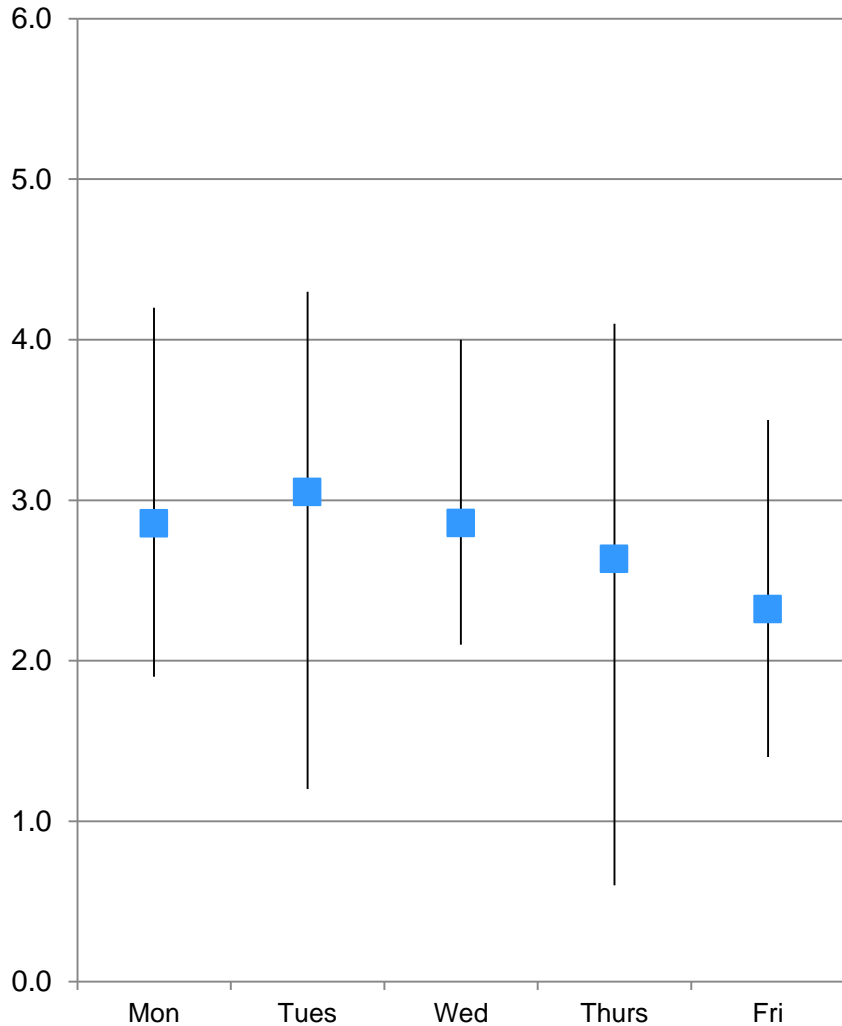


## New Schedule Simulation

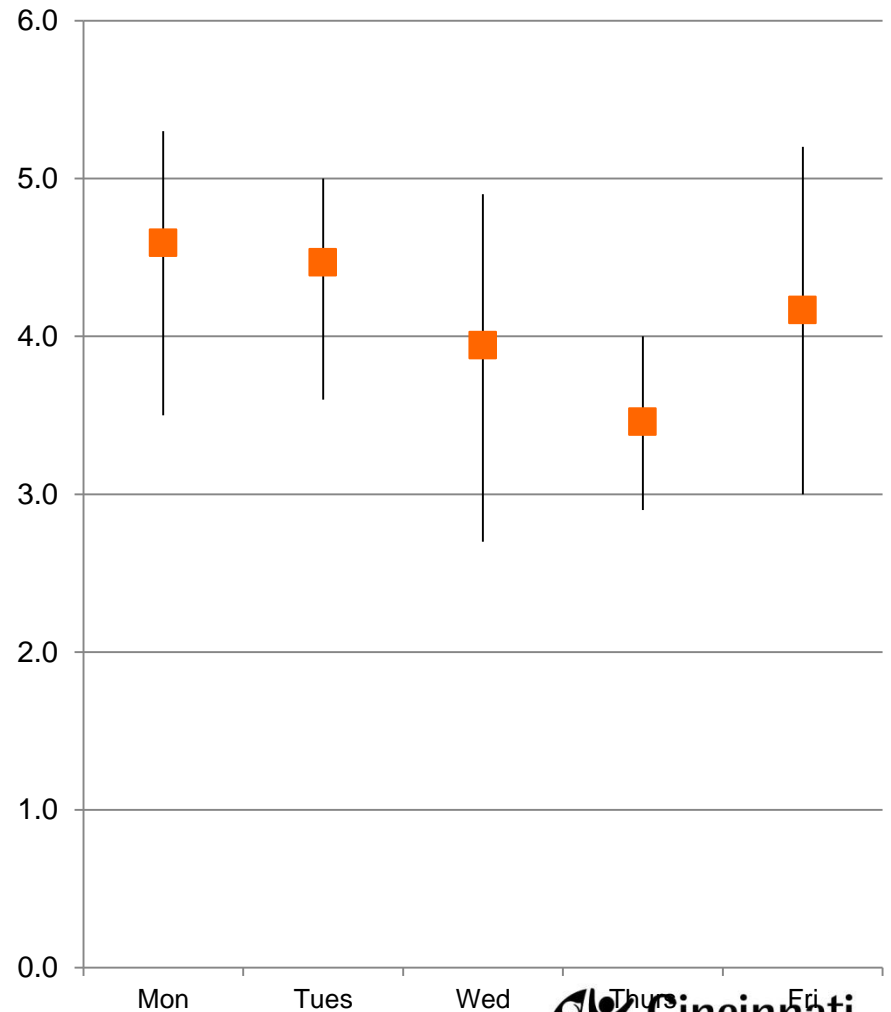


# Room Turns Per Day

## Baseline Simulation (2.7 avg)

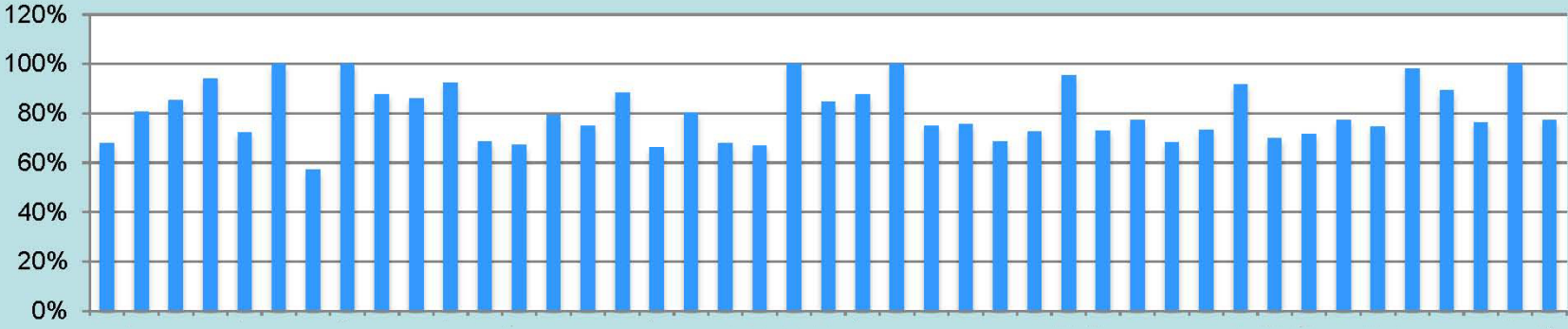


## New Schedule (4.1 avg)

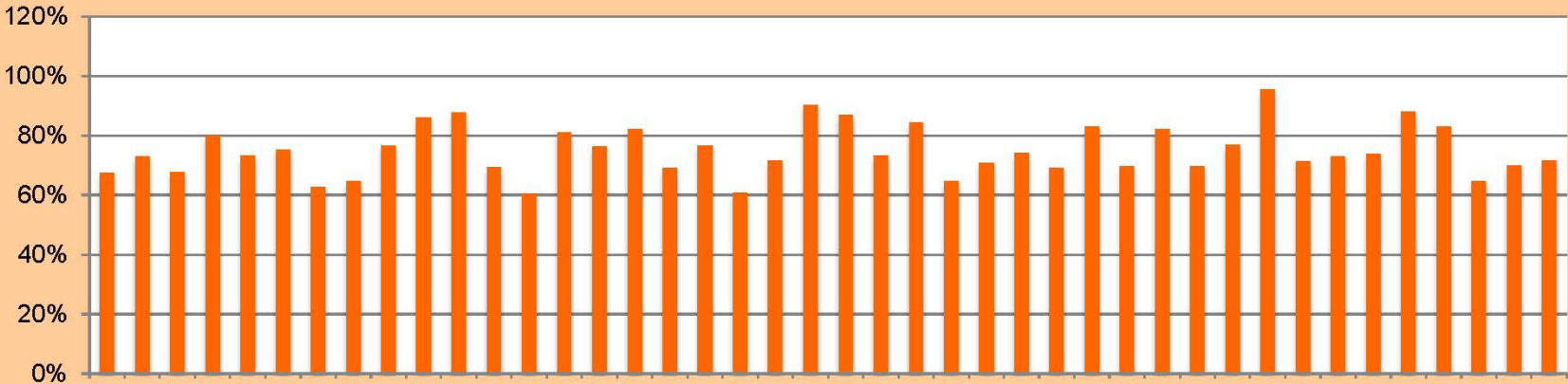


# Touch Time %

3 Month Baseline



New Schedule



# Results Analysis

- Increased resource utilization / throughput
  - Without increasing staff / resources
  - With no harm to patient service measures
  - Without increasing overtime/clinic duration
- Wide variability in patients per clinic and appointment types for physicians
- Different appointment durations for physicians
- Higher room utilization possible through scheduling (rooms scheduled only 83% of the time)



# Next Steps

- Enhance model to consider vacation schedules / clinic cancellations
- Validate proposed schedules with providers
- Examine opportunities for increased capacity with some physician schedules
- Add providers to fill open rooms
- Validate room allocation
- Explore use of consult room for nutrition and other resources