Improving Patient Flow in Obstetrics

Client: Los Barrios Unidos Community Clinic

Senior Design: Spring 2017

By Harvey Hauw and Shorjoe Bhattacharya

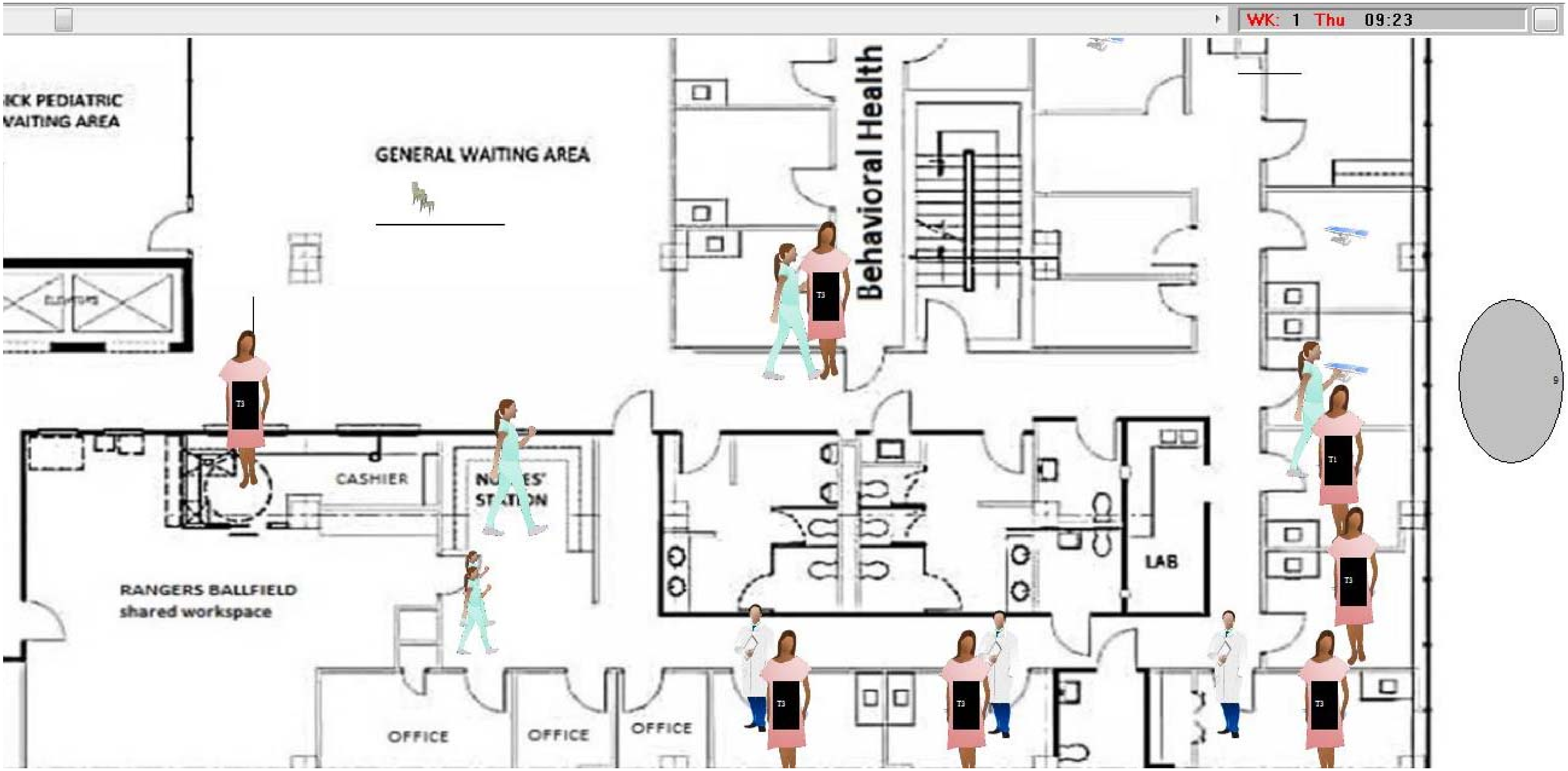

WK: 1 Thu 09:23
ICK PEDIATRIC
WAITING AREA
GENERAL WAITING AREA
Behavioral Health
CASHIER
RANGERS BALLFIELD
shared workspace
LAB
OFFICE
OFFICE
OFFICE

Table of Contents

Executive Summary

Los Barrios Unidos Community Clinic is clinic located in West Dallas. LBUCC offers services in many different healthcare sectors including pediatric care, behavioral health, and obstetrics. The focus of this project was in the obstetrics department. At this clinic, the obstetrics department was having an issue where patient satisfaction was dropping due to long wait times leading to long appointment durations.

Our senior design team was tasked with collecting time and motion data, mapping out current workflows of the clinic, running a simulation model and then analyzing the results. We collected data with a simple yet effective time and motion study where we asked the individual patients to log their times as they went station to station in the clinic. We also learned the workflows and layout of the clinic by talking to staff members at the location. All this information was taken and inputted into "MedModel" (specialty healthcare facilities simulation software) which ran the simulation of the Obstetrics Wing. With the simulation results we know there is a way to reduce wait times to improve the patient experience at LBUCC. If these recommendations are implemented properly it could significantly reduce wait times without large expenditures.

Project Background:

Los Barrios Unidos Clinic's Obstetrics Department provides fantastic care to its female patients according to surveys, but these patients have been experiencing long wait times during the start of the appointment and in between different stages of the appointment. Patients often have to return to the waiting room, and during those periods there patients are unsure about when they will be called be back into the obstetrics wing to continue their appointment. This long waiting experience decreases patient satisfaction and this causes them to be reluctant to choose LBUCC for their pediatric care, when they have their baby. This is a problem because more than three-fourths of LBUCC's patients live under the poverty line, so patient payment rates for obstetrics visits are not very high. But, if a patient comes in for Pediatric Care, even if a patient can't pay the Medicare or Medicaid will cover the cost and the hospital will generate revenue. This means that a great obstetrics experience is key for a hospital to generate revenue as LBUCC needs patients to choose LBU for pediatric care after their OB care.

The primary purpose of this project was to work with LBUCC to create a simulation model of their current Obstetrics Clinic using build simulation software called Med Model. Our group used the LBUCC obstetrics floor plan as the base layout for the model. This simulation's goal was to identify the actual bottlenecks that were clogging the system, and test solutions that could be used to reduce those bottlenecks and not create new ones. The goal of this simulation was to provide LBUCC with possible recommendations that could reduce wait times.

The data used for this model was collected from patient process time logs where we had patients documenting and logging their appointments.

Collecting Data

We had many different ideas to collect data but we ended up choosing the simplest method to collect data. Those methods are listed next:

- **Camera Method:** Initially our idea was to place camera just outside the waiting room door and record the entering and exiting of the patients. Each patient would be given a color-coded lanyard to match the patient type. For example in this method, the first time a type blue patient entered through the door we would record the time on the clock which would be in the background of the video camera view. Then when the same patient came out, we would note the exit time. Thus, we would know they finished that stage of the appointment process. This method had a flaw in it because we would be assuming the patient never directly completed two stages in the appointment process (like from exam room direct to sonogram room), but always came to the waiting room. We would also be assuming there was no additional unexpected delay that happened in the OB wing that we did not see.

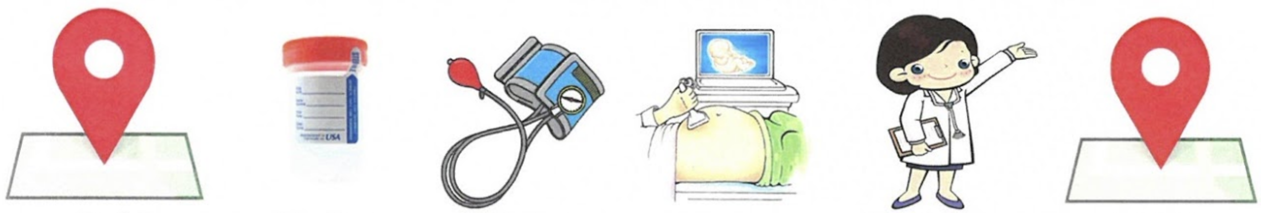
- **RFID Method:** Another idea we had was placing an RFID tag in each station, then have the physicians nudge the patient's get near enough to the tags so the time is automatically documented for that station. This would have been the most accurate method because we would know exactly how long the patient would be at each stage. Unfortunately, we did not have the resources to design this system.

- **Patient Self Record System:** Eventually our team ended up using the simplest data collection method with a prize incentive. We gave each patient a document indicating all possible stations they may go through and asked them to record their start and end times at each of those stations. People who filled in their documents were then entered in a raffle to win a prize. This system was effective because we even got to identify the patient’s wait times between stations so we could identify the average amount of time each person was waiting and where this wait was occurring. The form on the next page is the type of form we used to collect data.

Win up to $100 in Baby Supplies!
LBUCC Raffle Entry Form

Los Barrios Unidos
Community Clinic

Fill out this form with **TIME, (ex: 9:00AM)** that you begin and end each of the activities below and bring it back to the front desk as you exit the clinic to get your raffle ticket! All entries have a chance to win up to $100 in baby supplies!



	Check-in	Urine Test	Vitals Test	Sonogram	Meet Provider	Exit LBU
Start Time:	2:09pm *(Receive this form)*	2:18pm *(Enter Restroom)*	2:11pm *(Enter Vital Room)*	 *(Enter Sonogram Room)*	2:51pm *(Enter Doctor Room)*	
End Time:		2:21pm *(Leave Restroom)*	2:18pm *(Leave Vital Room)*	 *(Leave Sonogram Room)*	3:06pm *(Leave Doctor Room)*	3:20pm *(Return this form)*

What might we do to improve your experience when you visit our clinic? (Short Answer works fine ☺)

everything seems nice and smooth everytime i come.

Sources of Data

- **Patient time logging:** Patient's logged their hospital visits in a form that we designed (above). We took this date and inputted it into an excel spread sheet and analyzed it.
- **EHR Software:** Carlos averaged data sets to get arrival rate data for us, so we know how many patients are arriving are daily and at about what time they are arriving.
- **Carlos Ruiz:** Carlos is an LBUCC employee and he provided us with a significant amount of information regarding patient processes, patient types, estimated procedure times, and resource shift schedules per day.
- **Student Observation:** When data collection was going on with patients who were filling the logs a team of global health students were stationed at LBUCC and they were observing the procedure and ensuring the patients filled out the form correctly.

Patient Types

- **New Patient:** These patients come one day to do paperwork and then return scheduled on another day to go through the obstetrics procedure. These patients go through all stations for an OB appointment. There appointments are the longest type of appointments. New patients make up the 2nd highest part of the patient flow, but it is still less then 15% of the patient flow
- **New Patient Without Sonogram:** These patients also come one day to do paperwork and then return scheduled on another day to go through the obstetrics procedure. These patients are classified in the clinical records as new patients, but procedurally these patients do not go through the sonogram station, but go through all other stations for an OB appointment. This type of patient makes the lowest type of the patient flow at below 8%
- **Follow Up:** These patients are coming primarily to meet the provider and see if their pregnancy period is coming along well. These appointments are relatively simple and most of the time the baby is healthy so these are not very time consuming appointments. This type of appointment makes up highest part of the patient flow at more than 70%.

- **Only Sonogram Patient:** These are patients that are only coming to meet the sonogram doctor and run a sonogram test. This appointment is the most simple one. This type of appointment makes up the 2nd smallest part of the patient flow at below 10%.

Types of Employees

The employees who run operations in the obstetrics department consists of providers, nurse practitioners, medical assistants, check-in desk attendants, and sonogram doctors. This simulation records the operational activity that each staff member executes on a patient.

- **Check-In Desk Attendant:** This attendant takes proper documentation as the patient arrives for their appointment. They verify information such as insurance information. This attendant directs the patient to the main waiting room until their scheduled appointment time
- **Medical Assistant (MA):** This type of assistant in involved in much of the patient process. They do everything from taking vitals, walking the patient around, and scheduling them for their next check-up appointment. These assistants are the ones who send the patient back to the waiting area or send the patient directly to the next stage of their appointment.
- **Provider:** This is the main doctor who spends time with the patient in the exam room. They also chart the appointment for each patient. The provider's job is to ask the patient questions and analyze results from basic tests
- **Sonogram Doctor:** This doctor operates the sonogram machine. This doctor is an expert in the sonogram machine and does nothing else except interpret results and run it..
- **Nurse Practitioner:** A nurse practitioner can handle about 80% of the patient cases that a provider can. So, they can also meet patients and speak to them about their pregnancy. Only when there is a complication in obstetrics will they defer to a full-time provider.

All the staff members listed above also do other jobs such as additional paperwork, entering of data, and unexpected tasks which will arise if the problem has special problems. These special case tasks have been omitted from the model as they do not always effect the patient.

The Statistical Analysis of the Data

MedModel software can run simulation with fixed constant numbers and a wide variety of different distributions to simulate and run events like patient arrival cycles, operational time to complete a procedure, and even the number of kids or other family that come with a patient. After our team collected and entered data for each procedure in excel we calculated the distributions using MedModel's statfit tool. After doing this the computer gave distributions and then gave us the reliability score of the distributions. All distributions graphs are included at the end.

- **Arrivals:** We were given arrival data but the data was not clear, and we were not able to easily distinguish the numbers and calculate the arrival rates. Instead we fixed the number of patient arrivals on a day on a certain value which was calculated from an average of multiple days. For example, we said on Thursday, there would be 89 patients arriving. We got 89 from an average of 5 different recent Thursday's and set it at 89. Our arrival cycles were also not extremely accurate. We were given the number of patients that arrived in the first 5 hours of a day, and the number that arrived in the next 3 hours and then finally the last 2 hours. This allowed us to input arrival cycles for the patients so we knew when larger number of patients were arriving.

Time of Day	Percent of Patients Arriving Between these hours
Average Morning (7:00-12:00)	59%
Average Afternoon (12:00-15:00)	21%
Average Evening (15:00-17:00)	19%

- **Check-In Process:** Carlos Ruiz gave us an estimated time on the registration process and we confirmed the registration time from our data collection. There was not a selectable distribution for this stage so we fixed the numbers based on the number of forms the patient had to complete. On average, it takes patients about 1.5 minutes to register, with a standard deviation of 0.5 minutes. The check-in process time did not fluctuate in most cases.

- **Urine Sample:** This data was also collected from our data collection method. The distribution for this step is normal. There was not much variation in this process, as the mean was 3.5 minutes and standard deviation was 1.8 minutes.
- **Vitals:** The procedure of this consists of taking blood pressure, measuring heart rate, and doing other vital tests. This data was collected from our data collection method we executed. The selected distribution for this procedure is normal. There was a little more variation in this process, as the mean was 2.8 minutes and standard deviation was 2 minutes.
- **Meet with Provider:** This data was taken from our data collection procedure. Simply the patient discussed their current situation regarding their pregnancy with the provider. It fit a normal distribution with a mean of 13.9 minutes and a standard deviation of 11.9 minutes.
- **Sonogram:** This data was collected by our data collection procedure. This procedure is also standardized and followed a normal distribution with a mean of 17.5 minutes and standard deviation of 9.8 minutes.
- **Next Appointment Scheduling:** This data was collected by our data collection procedure. This procedure is fixed without a distribution with a mean of 3 minutes.
- **Patient User Distribution:** This data was given by Carlos Ruiz based on the EHR arrival schedules. It told us the distribution of the various patient types. The distribution is in the table below:

Patient Type	**Percent of Patients (Must Add Up to 100%)**
New Patient	12%
New Patient Without Sonogram	7%
Follow Up	72%
Only Sonogram Patient	9%

MedModel Software

Our software of choice MedModel, made by ProModel. This software is custom designed simulation software used to handle and simulate clinics, hospitals and other medical buildings so they can be improved. LBUCC gave us the floor plan of the obstetrics wing and based on that our team designed the locations, and subject path networks throughout the OB department. This software allowed us to make the obstetrics wing have all the moving parts that move daily through it. MedModel software is so detailed it even allows us to define custom walking speed of staff when moving with a patient or moving without. In our simulation model the 4 patient types move from their respective location to location based on workflow which was entered individually into processing based on patient type. The resources of the model, are the doctors and nurses can move with a patient or meet a patient at a certain location to execute their duty. This software allows us to observe the movement of the patients and resources to see if they are going to the right locations and then it tells us the results of the simulation.

Various Components of MedModel:

- **Locations:** In this place, each operation is done to an entity whether it be talking to the doctor or taking vitals or even waiting.
- **Entities:** These are the main figures that flow through the model and have operations and work done on them. Entities are the patients of the model. In the next section, more detailed information is given regarding patient types and flows.
- **Processing:** This is the core portion of the model that inserts logic and maps out the patient flow. There are 2 major parts of processing: movement and operation at a location and routing to the next location after operation is complete. Most of the logic is inserted here.
- **Resources:** These are the staff members in the obstetrics clinic. The people are providers, MA's, check-in desk attendants, and the sonogram doctor **.**
- **Path Networks:** Entities and resources move through the model on these paths. In some models entities and resources move on the same path network and in others it is different.
- **Arrivals:** These dictate the frequency and occurrence of the arrivals and state how many patients arrive over a certain period.

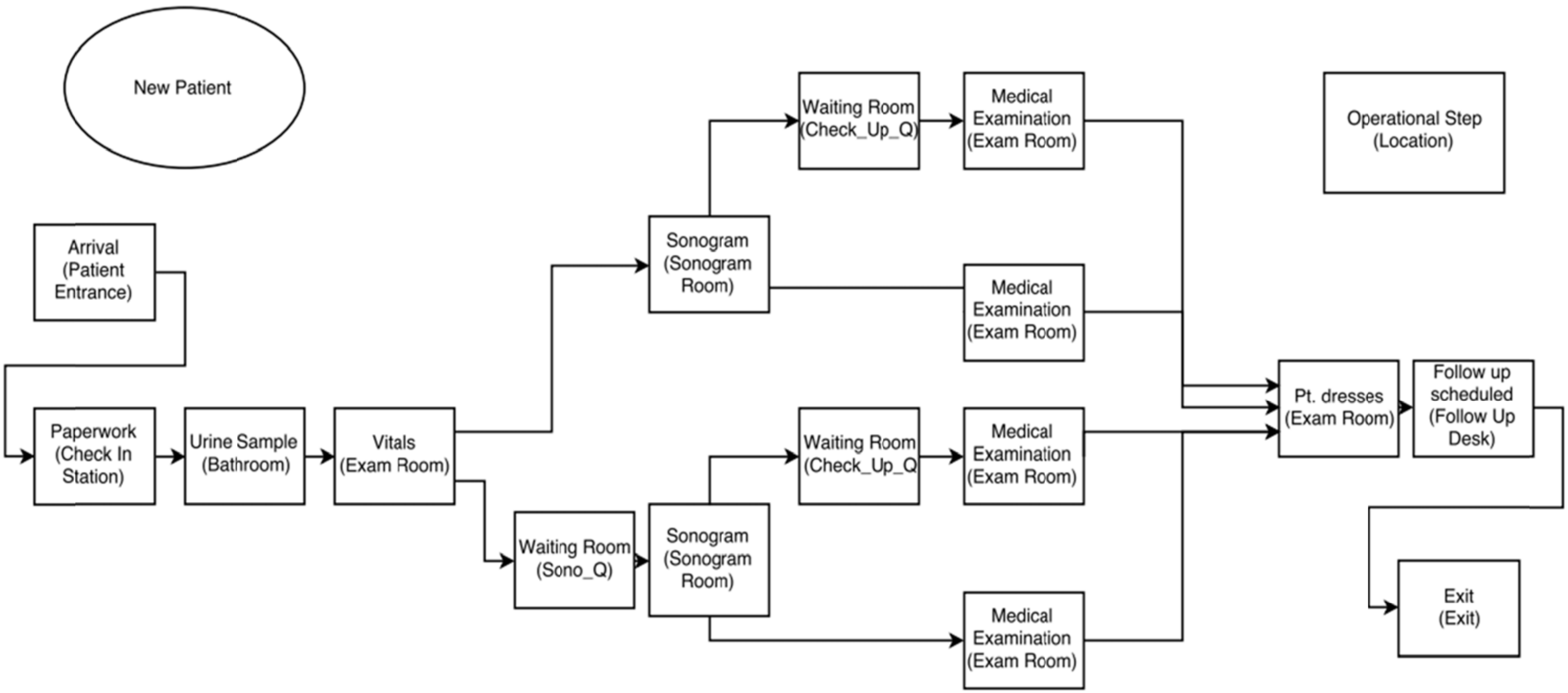
- **Attributes:** These are certain custom characteristics that can be applied on an entity. In this model this included if patients have filled forms, met the provider, and whether they are a type 1,2,3, or 4 patient.
- **Variables:** These are place holders that represent numeric values that change. In this model the variables kept count of number of patients processed, and the number in the waiting room.

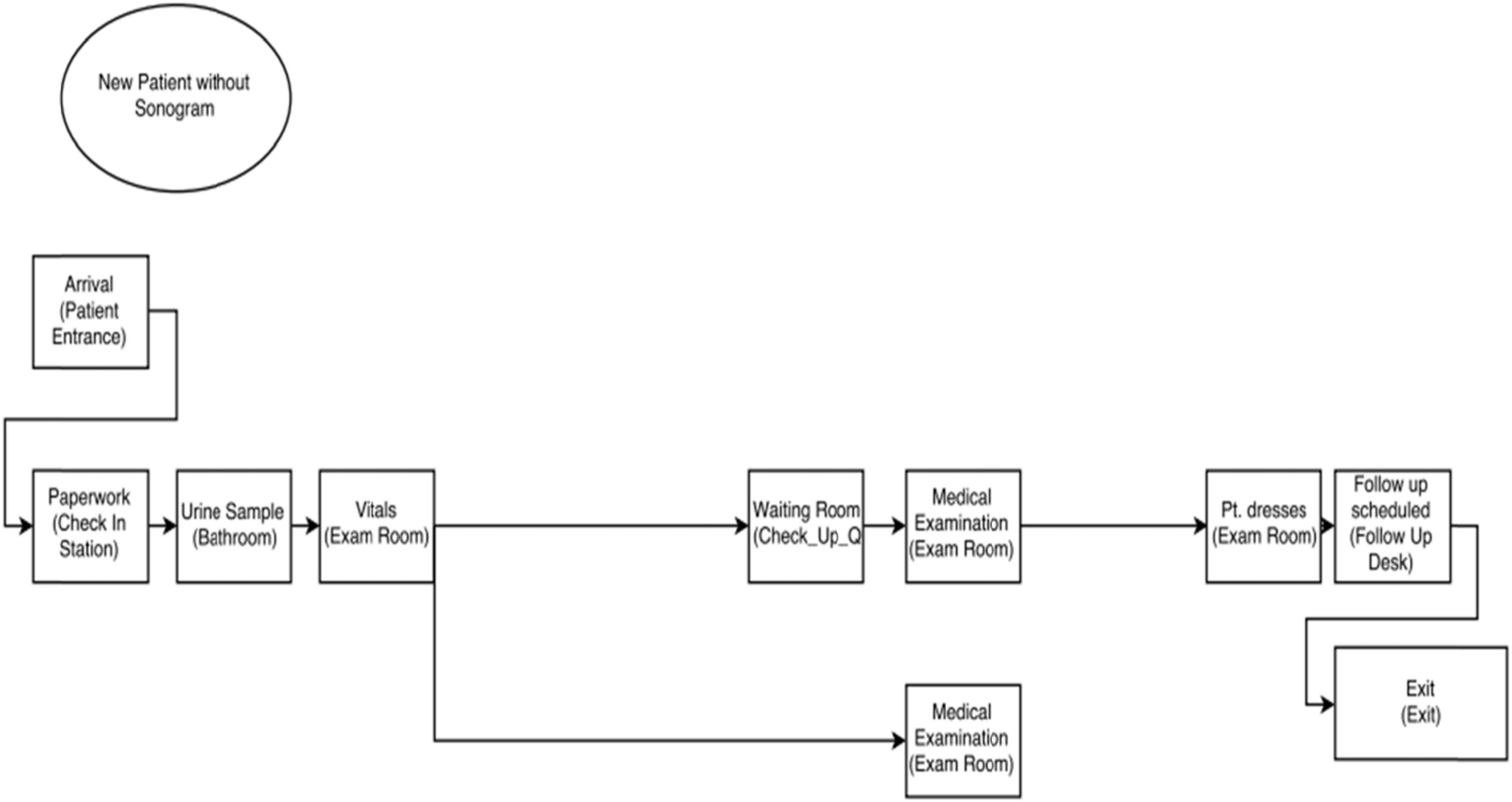
Locations

- **Patient Entrance:** This is the place where all the patients enter the simulation flow. After walking upstairs this is the place where the patients can enter the obstetrics wing
- **Wait_Q:** This is the place where patients will wait until the check-in desk is free
- **CheckIn_Station_1:** This is where the patients verify forms and fill out forms if needed. The patients will then wait in the waiting room until called in.
- **Waiting_Room_A:** This is where the patients wait until they are called in for their appointment.
- **Bathroom_X:** This is where patients create their urine sample.
- **Exam_Room_X:** In the exam room the MA takes patient vitals such as blood pressure, temperature, heart rate, etc. The patient will also meet the provider in this room to discuss their current situation.
- **Check_Up_Q:** After vitals if the patient is waiting for the provider to come and meet with them, the patient will wait in this line.
- **Sonogram_Room:** This room is where the patient meets the sonogram doctor and uses the machin.e
- **Sono_Q:** If after vitals the sonogram room is busy the patient will wait in this line to meet the sonogram doctor.
- **Follow_Up_Desk_1:** After the patient finishes the appointment they go to this follow up desk to meet an MA and schedule the next one.
- **Exit:** The patients leave the model from here

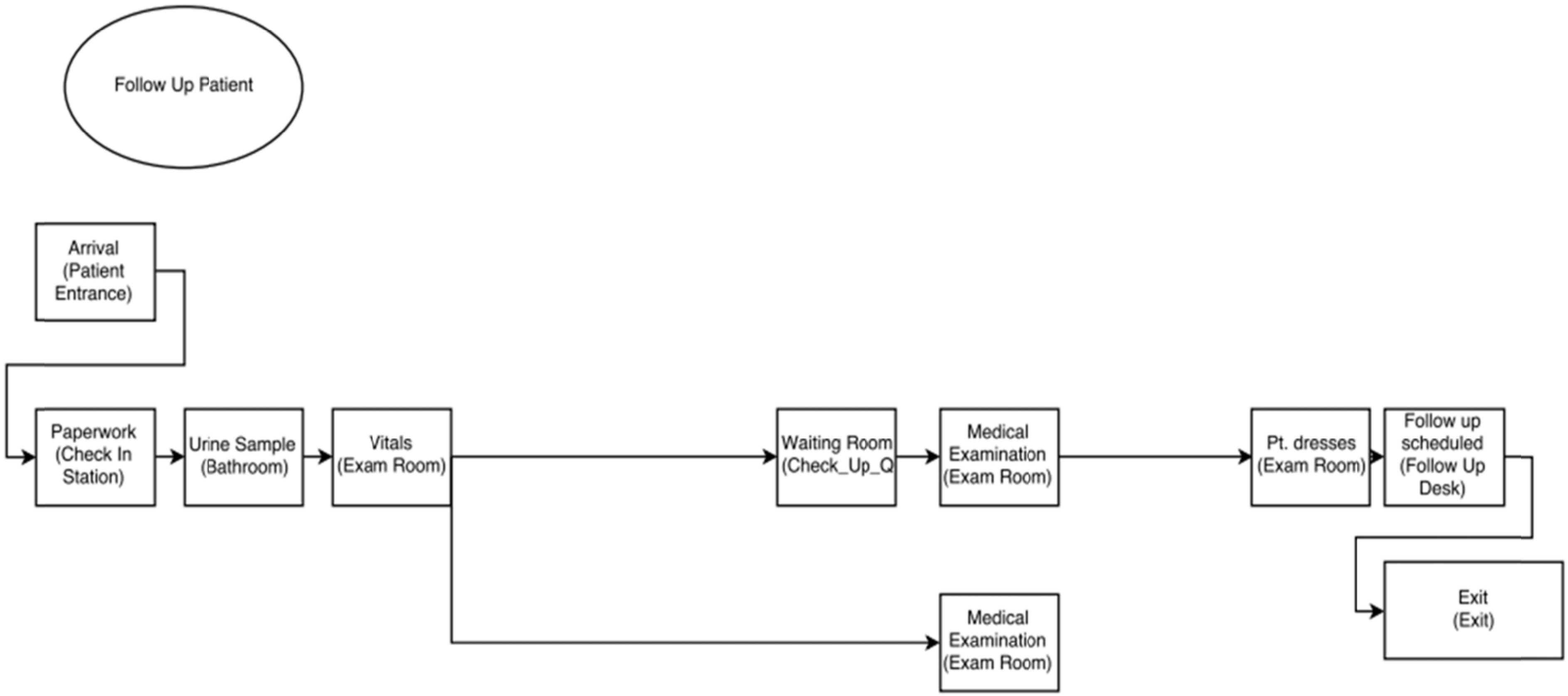
Patient Flow:

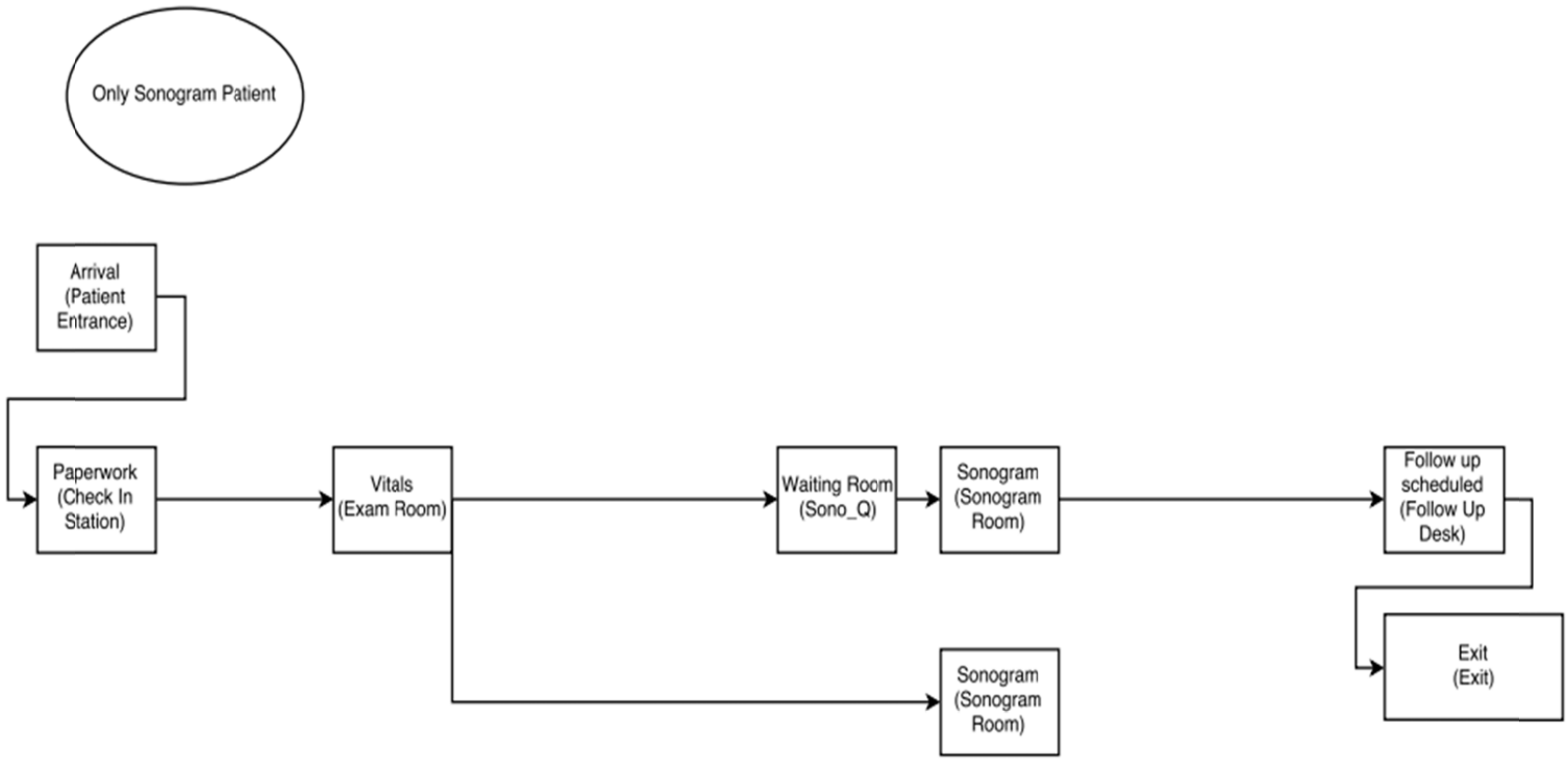
Each type of patient has a few different alternatives to take through the model. The flow charts below show all the possible movements of the 4 types of patients.





New Patient without Sonogram
Arrival (Patient Entrance)
Paperwork (Check In Station)
Urine Sample (Bathroom)
Vitals (Exam Room)
Waiting Room (Check_Up_Q
Medical Examination (Exam Room)
Pt. dresses (Exam Room)
Follow up scheduled (Follow Up Desk)
Exit (Exit)
Medical Examination (Exam Room)


Follow Up Patient
Arrival (Patient Entrance)
Paperwork (Check In Station)
Urine Sample (Bathroom)
Vitals (Exam Room)
Waiting Room (Check_Up_Q
Medical Examination (Exam Room)
Pt. dresses (Exam Room)
Follow up scheduled (Follow Up Desk)
Exit (Exit)
Medical Examination (Exam Room)


Only Sonogram Patient
Arrival (Patient Entrance)
Paperwork (Check In Station)
Vitals (Exam Room)
Waiting Room (Sono_Q)
Sonogram (Sonogram Room)
Follow up scheduled (Follow Up Desk)
Exit (Exit)
Sonogram (Sonogram Room)

Analysis and Recommendations

Initially this model had several bugs in it, but over the course of the semester we were able to fix those bugs, which made the model start running properly. The model was tested several times to see if the output time data was matching or close to the actual collected time data. Meaning we were checking to see if the estimated average time to complete an appointment was estimated to be close to our simulated time.

When we first began running the simulation we ran it for each day of the week. The resource deployment times varied but LBU ran 2 check-in desk attendants, 1 sonogram doctor, 5 to 9 medical assistants, and 2 to 4 providers per day. Each day at LBUCC ran 7AM to 5PM so we ran our simulation for that period.

The first problem we found had to do with over utilization of providers which led to patients finishing after the 5PM closing time. Sometimes LBU has 2 providers stationed during part of the day. So, we based on the model we found out that if LBU stationed 2 providers throughout the day for a week they would on average be utilized 82.58% per week. Even at such a high utilization rate on average about 24 patients per day were not finishing their appointments by the end of the day at 5pm and were finishing later, so patients and resources waited longer and left later each day. With 3 providers placed at all times throughout the day for a week they were being used at a utilization rate of 76.16%. With 3 providers on average about 6.4 patients were finishing after 5PM. We next found that adding another additional provider (4 providers total) at all times helped reduce patient wait times and brought the provider utilization levels of 56.60% with only about 3.2 patients per day finishing after 5pm. This meant that adding a 3rd provider at all times and sometimes bringing in a 4th provider during certain heavy shifts, it would be easier to reduce the load and ensure few patients finish after 5PM.

Another issue was with the MA utilization. LBU has a ratio where they operate 2 MA’s for every provider so when we added provider to the simulation but did not add 2 more MA’s, the waiting times slightly fell but MA utilization rate skyrocketed. This could be a problem that could lead to a reduction in MA productivity. Thus, it does not seem to be an efficient idea to increase number of providers without also increasing the number of MA’s by at least one. See the following chart to compare:

Resources	MA Utilization
5 MA's and 2 Providers	66.4% (Highest Wait Times, see below)
5 MA's and 3 Providers	83.5% (Wait times only slightly drop-run model to see results)
6 MA's and 3 Providers	63.3%
7 MA's and 3 Providers	59.9%

Based on this table it looks like adding a single MA instead of two could give an optimal balance where the MA's are being properly utilized and cost is being kept down. Thus, if 3 providers are working 6 MA's may be optimal

So, for resource allocation we believe there are 2 recommendations depending on clinic priorities:

- Recommendation 1 is to deploy at least 3 providers and 7 MA's always throughout the week. When this happens average time in system drops to only 56.03 minutes from 87.67 minutes when only 2 providers are working. LBU sometimes runs 2 providers and sometimes 3 providers during the day, so the wait times will actually be in between 56.035 and 24.645. But, according to LBU shifts nearly half the week is operated with 2 providers and according to staff providers also arrive late. This means the wait times will be closer to 56.035 minutes than 24.465. So, having a 3rd provider at all times will ensure wait times are at 24.645 minutes or less. The 3rd provider will also ensure very few patients finish their appointments after 5PM.
- Recommendation 2 is to have a 4th provider and 2 more MA's on standby that can be deployed on certain shifts when there is high volume of patients, particularly on certain mornings. As described in the beginning of this section, provider utilization rates are very high when only 3 are working, so a 4th one during certain shifts will further reduce wait times.

The table below has the data used for the recommendations listed above.

Resources	Time in System (min)	Time in Operation (min)	Wait time (min)
5 MA’s and 2 Providers	87.67	31.635	56.035
7 MA’s and 3 Providers	56.033	31.388	24.645
9 MA’s and 4 Providers	51.106	32.3505	18.755

In regards to arrival distribution LBU was having a problem where too many patients were arriving together in the morning hours and causing increased wait times for each other, since all resources were being heavily utilized during those hours. Below we posted the results for what would happen if LBU scheduled appointments so patients arrived more even throughout the day. The following wait and operation times have been calculated based on the following patient arrival distribution:

Ideal Arrival Distribution

Time	Percent of Patients Arrived
7AM	10%
8AM	10%
9AM	10%
10AM	10%
11AM	10%
12AM	10%
1PM	10%
2PM	10%
3PM	10%
4PM	10%
5PM	10%

	Time in System (min)	**Time in Operation (min)**	**Wait time (min)**
Current Arrival Distribution (Based on tables in the appendix)	56.57	31.38	25.19
Optimal Arrival (Distribution using table above)	53.46	33.81	19.65

With 7 MA's and 3 Providers

So, for arrival distribution we believe there is one recommendation

- There is no additional cost for the clinic to spread appointments more evenly throughout the day. So, we recommend the clinic distributes appointment schedules as it reduces wait times by nearly 6 minutes without the clinic having to spend anything on additional resources.

While at LBU some staff members stated that a single sonogram room was causing a increased wait times for patients. Running the model disproved that as only 19% of all patients needed to use a sonogram room, and the room was being utilized at a rate of 63.94% on average per week. At LBU some of the staff also thought that there was an exam room shortage. All 100% of the types of patients at LBU use the exam room but there are 8 exam rooms. So, when the model was run with current resources and current arrival rates, we found that exam rooms were being utilized at a rate of 56.06% per week. Thus, both scenarios were proven to be untrue.

Next Phase in this project

This whole model has limitations and can be made more accurate Here are the following ideas that should be done in phase 2 of this project:

- This model provides results based on day of the week. Thus, resources can only be removed or added for only a full day at a time. Currently it is not possible to add a resource for only part of a day. Thus, shifts should be added to the model. So, if we find out Wednesday from 8AM to 11AM is the busiest time of the week we can add additional resources only for that time span. With shift scheduling we will also be able to add when a resource is on break and is resting. This will allow us to allocate resources more efficiently and it will help the clinic know if what kind of resource they need to hire (part time or full time) and when to deploy it.
- From our discussion with LBUCC staff members we found out that providers often arrive late. If this probability of the doctor arriving late can be incorporated into the model, we will have a better understanding if it the lack of resources that is causing the backlog or is it because the doctors are not showing up on time. This additional information will give the LBUCC team better decision making ability.
- We also need to increase the accuracy of our arrival schedules in the model. Right now, we only know what percentage of patients are arriving between 7AM and 12PM, 12PM and 3PM and 3PM and 5PM. We don't know what percent is arriving between 7AM and 8AM, 8AM and 9AM… 4PM and 5PM on each day of the week. If we can calculate the data based on arrival data that will give us very accurate arrival results to further improve the model and allow greater assigning of appointment times.

Appendix

Med Model Code

```
********************************************************************************
*                                                                              *
*                    Formatted Listing of Model:                               *
*         C:\Users\user\Desktop\MedModel_SD\ReDoBettere_FIXED.mod              *
*                                                                              *
********************************************************************************

 Time Units:                Minutes
 Distance Units:            Feet


********************************************************************************
*                              Locations                                       *
********************************************************************************

 Name                 Cap Units Stats       Rules         Cost
 -------------------- --- ----- ----------- ------------- ------------
 Bathroom_1            1   1     Time Series Oldest, ,
 Bathroom_2            1   1     Time Series Oldest, ,
 Exam_Room_1           1   1     Time Series Oldest, ,
 Exam_Room_2           1   1     Time Series Oldest, ,
 Exam_Room_3           1   1     Time Series Oldest, ,
 Exam_Room_4           1   1     Time Series Oldest, ,
 Exam_Room_5           1   1     Time Series Oldest, ,
 Exam_Room_6           1   1     Time Series Oldest, ,
 Exam_Room_7           1   1     Time Series Oldest, ,
 Sonogram_Room         1   1     Time Series Oldest, ,
 Exam_Room_8_No_Vitals 1   1     Time Series Oldest, ,
 Follow_Up_Desk_1      2   1     Time Series Oldest, ,
 CheckIn_Station_1     2   1     Time Series Oldest, FIFO,
 Waiting_Room_A        25  1     Time Series Oldest, ,
 Patient_Entrance      inf 1     Time Series Oldest, ,
 Wait_Q                inf 1     Time Series Oldest, FIFO,
 Sono_Q                inf 1     Time Series Oldest, FIFO,
 Check_Up_Q            inf 1     Time Series Oldest, FIFO,
 Leave                 25  1     Time Series Oldest, ,
 Chair                 1   1     Time Series Oldest, ,
```

****
* Entities *
****

Name	Speed (fpm)	Stats	Cost
Female_Patient_New	200	Time Series	
Female_Patient_New_Without_Son	200	Time Series	
Female_Patient_FollowUp	200	Time Series	
Female_Patient_Only_Sono	200	Time Series	
PATIENT	200	Basic	

```
*********************************************************************************
*                    Path Networks                            *
*********************************************************************************

 Name       Type        T/S            From     To       BI  Dist/Time  Speed Factor
 ---------- ----------- ---------------- -------- -------- ---- ---------- ------------
 Clinic_Net Passing     Speed & Distance N1       N2       Bi   6.08       1
                          N2       N3       Bi   33.13      1
                          N3       N4       Bi   9.63       1
                          N3       N5       Bi   5.85       1
                          N3       N6       Bi   40.29      1
                          N6       N7       Bi   54.86      1
                          N7       N8       Bi   9.00       1
                          N7       N9       Bi   23.00      1
                          N9       N10      Bi   13.00      1
                          N10      N11      Bi   11.85      1
                          N10      N12      Bi   18.85      1
                          N12      N13      Bi   11.85      1
                          N12      N14      Bi   17.00      1
                          N12      N15      Bi   18.16      1
                          N15      N16      Bi   4.85       1
                          N15      N17      Bi   15.14      1
                          N17      N18      Bi   10.85      1
                          N17      N19      Bi   34.14      1
                          N19      N20      Bi   9.85       1
                          N19      N21      Bi   19.14      1
                          N21      N22      Bi   8.85       1
                          N9       N23      Bi   21.00      1
                          N23      N24      Bi   11.85      1
                          N23      N25      Bi   14.14      1
                          N23      N26      Bi   13.14      1
                          N26      N27      Bi   14.85      1
                          N26      N28      Bi   17.59      1
                          N21      N29      Bi   13.14      1
                          N21      N30      Bi   22.67      1
                          N21      N31      Bi   21.60      1
                          N21      N32      Bi   20.80      1
                          N21      N33      Bi   20.56      1
                          N21      N34      Bi   20.14      1
                          N26      N35      Bi   6.00       1
                          N3       N36      Bi   5.85       1
                          N2       N37      Bi   7.29       1
```

```
*********************************************************************************
*                   Interfaces                    *
*********************************************************************************

 Net       Node      Location
 ---------- ---------- --------------------
 Clinic_Net N1        Patient_Entrance
           N2        CheckIn_Station_1
           N3        Waiting_Room_A
           N8        Bathroom_1
           N16       Bathroom_2
           N20       Exam_Room_1
           N18       Exam_Room_2
           N14       Exam_Room_3
           N13       Exam_Room_4
           N11       Exam_Room_5
           N9        Exam_Room_6
           N24       Exam_Room_7
           N27       Sonogram_Room
           N28       Exam_Room_8_No_Vitals
           N7        Follow_Up_Desk_1
           N36       Check_Up_Q
           N37       Wait_Q
           N35       Sono_Q
```

```
********************************************************************************
*                        Mapping                        *
********************************************************************************

 Net       From      To        Dest
 ---------- ---------- ---------- ------------
 Clinic_Net N2        N1
            N3        N2
            N6        N3
            N7        N6
            N9        N7
            N10       N9
            N12       N10
            N15       N12
            N17       N15
            N19       N17
            N21       N19
            N23       N9
            N26       N23
            N2        N3
            N3        N6
            N6        N7
            N7        N8
            N7        N9
            N9        N10
            N10       N11
            N10       N12
            N12       N13
            N12       N14
            N12       N15
            N15       N16
            N15       N17
            N17       N18
            N17       N19
            N19       N20
            N9        N23
            N23       N24
            N23       N26
            N26       N27
            N26       N28
            N19       N21
            N21       N29
            N21       N30
            N21       N31
            N21       N32
            N21       N33
            N21       N34
            N26       N35
```

```
      N3      N36
      N2      N37

**********************************************************************************
*                    Resources                         *
**********************************************************************************

                      Res    Ent
 Name                 Units Stats   Search  Search Path       Motion        Cost
 ---------------------- ----- -------- ------- ------ ---------- -------------- ------------
 MA                   7    By Unit  None    Oldest Clinic_Net Empty: 200 fpm
                                Home: N30  Full: 200 fpm
                                (Return)

 Provider              3    By Unit  Closest Oldest Clinic_Net Empty: 200 fpm
                                Home: N31  Full: 150 fpm
                                (Return)

 Sonogram_Doctor        1    By Unit  Closest Oldest Clinic_Net Empty: 50 fpm
                                Home: N32  Full: 50 fpm
                                (Return)

 CheckIn_Desk_Attendent  2    By Unit  Closest Oldest Clinic_Net Empty: 10 fpm
                                Home: N33  Full: 10 fpm
                                (Return)

 FollowUp_Desk_Attendent 2    By Unit  Closest Oldest Clinic_Net Empty: 10 fpm
                                Home: N34  Full: 10 fpm
                                (Return)
```

```
********************************************************************************
*                         Processing                         *
********************************************************************************


 Entity                  Location            Operation          Blk   Output                   Destination
Rule     Move Logic
 ---------------------------- -------------------- ------------------   ---- ---------------------------- ------------------
--- -------  ------------
 PATIENT                    Patient_Entrance      aPatient_Type=patient_type()
                                      /*Route aPatient_Type*/

                                      If aPatient_Type=1 Then
                                      {
                                              Route 1
                                      }
                                      If aPatient_Type=2 Then
                                      {
                                              Route 2
                                      }
                                      If aPatient_Type=3 Then
                                      {
                                              Route 3
                                      }
                                      If aPatient_Type=4 Then
                                      {
                                              Route 4
                                      }
                                      If aPatient_Type=5 Then
                                      {
                                              Route 5
                                      }
                                                     1    Female_Patient_New            Wait_Q              FIRST
1  Move On Clinic_Net
                                                     2    Female_Patient_New_Without_Son Wait_Q
FIRST 1  Move On Clinic_Net
                                                     3    Female_Patient_FollowUp       Wait_Q
FIRST 1  Move On Clinic_Net
                                                     4    Female_Patient_Only_Sono      Wait_Q
FIRST 1  Move On Clinic_Net
 ALL                     Wait_Q              Move for .1          1    ALL                      CheckIn_Station_1
FIRST 1  Inc aForms_Done
 Female_Patient_New           CheckIn_Station_1     GRAPHIC 1
                                      If aForms_Done=1 Then
                                      {
                                              Wait N(1,.2) min
                                      }
```

Else
{
Wait N(2,.5) min
}

1 Female_Patient_New Waiting_Room_A
FIRST 1 Move On Clinic_Net
Female_Patient_New Waiting_Room_A aTotal_time_waiting_room = Clock()
Inc Waitroom_count,1
If Waitroom_count>Waitroom_Max Then
Waitroom_count=Waitroom_Max
Dec Waitroom_count
1 Female_Patient_New Bathroom_1
FIRST 1 Move With MA

Female_Patient_New Bathroom_2
FIRST Move With MA

Female_Patient_New Bathroom_1 Wait N(3.5,1.8) min
1 Female_Patient_New Exam_Room_1
FIRST 1 Move with MA
Female_Patient_New Exam_Room_2
FIRST Move with MA
Female_Patient_New Exam_Room_3
FIRST Move with MA
Female_Patient_New Exam_Room_4
FIRST Move with MA
Female_Patient_New Exam_Room_5
FIRST Move with MA
Female_Patient_New Exam_Room_6
FIRST Move with MA
Female_Patient_New Exam_Room_7
FIRST Move with MA
Female_Patient_New
Exam_Room_8_No_Vitals FIRST Move with MA
Female_Patient_New Bathroom_2 Wait N(3.5,1.8) min
1 Female_Patient_New Exam_Room_1
FIRST 1 Move with MA
Female_Patient_New Exam_Room_2
FIRST Move with MA
Female_Patient_New Exam_Room_3
FIRST Move with MA
Female_Patient_New Exam_Room_4
FIRST Move with MA
Female_Patient_New Exam_Room_5
FIRST Move with MA
Female_Patient_New Exam_Room_6
FIRST Move with MA

Female_Patient_New Exam_Room_7
FIRST Move with MA
Female_Patient_New
Exam_Room_8_No_Vitals FIRST Move with MA
Female_Patient_New Exam_Room_1 Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Exam_Room_2 Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Exam_Room_3 Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Exam_Room_4 Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Exam_Room_5 Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Exam_Room_6 Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Exam_Room_7 Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Exam_Room_8_No_Vitals Use MA For N(2.8,2) min
1 Female_Patient_New Sono_Q,1 FIRST
1 Move On Clinic_Net
Female_Patient_New Sono_Q Graphic 1 1 Female_Patient_New
Sonogram_Room FIRST 1 Move with MA
Female_Patient_New Sonogram_Room Use Sonogram_Doctor For N(17.5,9.8) min

```
If aProvider_CheckUp = 1 Then
{
        Route 1
}
Else
{
        Route 2
}
```

1 Female_Patient_New Exam_Room_1
FIRST 1 Move with MA Then Free
Female_Patient_New Exam_Room_2
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_3
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_4
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_5
FIRST Move with MA Then Free

Female_Patient_New Exam_Room_6
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_7
FIRST Move with MA Then Free
Female_Patient_New
Exam_Room_8_No_Vitals FIRST Move with MA Then Free
2 Female_Patient_New Check_Up_Q
FIRST 1 Move on Clinic_Net
Female_Patient_New Check_Up_Q Graphic 1 1 Female_Patient_New
Exam_Room_1 FIRST 1 Move with MA Then Free
Female_Patient_New Exam_Room_2
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_3
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_4
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_5
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_6
FIRST Move with MA Then Free
Female_Patient_New Exam_Room_7
FIRST Move with MA Then Free
Female_Patient_New
Exam_Room_8_No_Vitals FIRST Move with MA Then Free
Female_Patient_New Exam_Room_1 Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Exam_Room_2 Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Exam_Room_3 Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Exam_Room_4 Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Exam_Room_5 Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Exam_Room_6 Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Exam_Room_7 Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Exam_Room_8_No_Vitals Use Provider For N(13.9,11.9) min
1 Female_Patient_New Follow_Up_Desk_1
FIRST 1 Move On Clinic_Net
Female_Patient_New Follow_Up_Desk_1 Use MA For 3 min
Free MA 1 Female_Patient_New EXIT
FIRST 1 INC vPatient_Count

Female_Patient_New_Without_Son CheckIn_Station_1 GRAPHIC 1
If aForms_Done=1 Then
{
Wait N(1,.2) min
}
Else
{
Wait N(2,.5) min
}
1 Female_Patient_New_Without_Son Waiting_Room_A
FIRST 1 Move On Clinic_Net
Female_Patient_New_Without_Son Waiting_Room_A aTotal_time_waiting_room = Clock()

1 Female_Patient_New_Without_Son Bathroom_1
FIRST 1 Move with MA
Female_Patient_New_Without_Son Bathroom_2
FIRST Move with MA
Female_Patient_New_Without_Son Bathroom_1 Wait N(3.5,1.8) min
1 Female_Patient_New_Without_Son Exam_Room_1
FIRST 1 Move with MA
Female_Patient_New_Without_Son Exam_Room_2
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_3
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_4
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_5
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_6
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_7
FIRST Move with MA
Female_Patient_New_Without_Son
Exam_Room_8_No_Vitals FIRST Move with MA
Female_Patient_New_Without_Son Bathroom_2 Wait N(3.5,1.8) min
1 Female_Patient_New_Without_Son Exam_Room_1
FIRST 1 Move with MA
Female_Patient_New_Without_Son Exam_Room_2
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_3
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_4
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_5
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_6
FIRST Move with MA
Female_Patient_New_Without_Son Exam_Room_7
FIRST Move with MA
Female_Patient_New_Without_Son
Exam_Room_8_No_Vitals FIRST Move with MA

```
 Female_Patient_New_Without_Son Exam_Room_1          Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Exam_Room_2          Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Exam_Room_3          Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Exam_Room_4          Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Exam_Room_5          Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Exam_Room_6          Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Exam_Room_7          Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Exam_Room_8_No_Vitals Use MA For N(2.8,2) min
                                                  Free MA
                                                  Use Provider For N(13.9,11.9) min
                                                  Free Provider       1    Female_Patient_New_Without_Son
Follow_Up_Desk_1      FIRST 1  Move On Clinic_Net
 Female_Patient_New_Without_Son Follow_Up_Desk_1      Use MA For 3 min
                                                  Free MA            1    Female_Patient_New_Without_Son EXIT
FIRST 1  INC vPatient_Count


 Female_Patient_FollowUp        CheckIn_Station_1     GRAPHIC 1
                                                  If aForms_Done=1 Then
                                                  {
                                                          Wait N(1,.2) min
                                                  }
                                                  Else
```

{
Wait N(2,.5) min
}
1 Female_Patient_FollowUp Waiting_Room_A
FIRST 1 Move On Clinic_Net
Female_Patient_FollowUp Waiting_Room_A aTotal_time_waiting_room = Clock()
Wait 13.45 min 1 Female_Patient_FollowUp Bathroom_1
FIRST 1 Move with MA
Female_Patient_FollowUp Bathroom_2
FIRST Move with MA
Female_Patient_FollowUp Bathroom_1 WAIT N(3.4,1.8) min
1 Female_Patient_FollowUp Exam_Room_1
FIRST 1 Move with MA
Female_Patient_FollowUp Exam_Room_2
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_3
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_4
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_5
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_6
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_7
FIRST Move with MA
Female_Patient_FollowUp
Exam_Room_8_No_Vitals FIRST Move with MA
Female_Patient_FollowUp Bathroom_2 WAIT N(3.4,1.8) min
1 Female_Patient_FollowUp Exam_Room_1
FIRST 1 Move with MA
Female_Patient_FollowUp Exam_Room_2
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_3
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_4
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_5
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_6
FIRST Move with MA
Female_Patient_FollowUp Exam_Room_7
FIRST Move with MA
Female_Patient_FollowUp
Exam_Room_8_No_Vitals FIRST Move with MA
Female_Patient_FollowUp Exam_Room_1 Use MA For N(3.4,2.1) min
Free MA
Use Provider For N(18.9,15.2) min
Free Provider 1 Female_Patient_FollowUp
Follow_Up_Desk_1 FIRST 1 Move On Clinic_Net
Female_Patient_FollowUp Exam_Room_2 Use MA For N(3.4,2.1) min
Free MA

```
                                   Use Provider For N(18.9,15.2) min
                                   Free Provider     1   Female_Patient_FollowUp
Follow_Up_Desk_1     FIRST 1  Move On Clinic_Net
 Female_Patient_FollowUp      Exam_Room_3        Use MA For N(3.4,2.1) min
                                   Free MA
                                   Use Provider For N(18.9,15.2) min
                                   Free Provider     1   Female_Patient_FollowUp
Follow_Up_Desk_1     FIRST 1  Move On Clinic_Net
 Female_Patient_FollowUp      Exam_Room_4        Use MA For N(3.4,2.1) min
                                   Free MA
                                   Use Provider For N(18.9,15.2) min
                                   Free Provider
                                                 1   Female_Patient_FollowUp      Follow_Up_Desk_1
FIRST 1  Move On Clinic_Net
 Female_Patient_FollowUp      Exam_Room_5        Use MA For N(3.4,2.1) min
                                   Free MA
                                   Use Provider For N(18.9,15.2) min
                                   Free Provider     1   Female_Patient_FollowUp
Follow_Up_Desk_1     FIRST 1  Move On Clinic_Net
 Female_Patient_FollowUp      Exam_Room_6        Use MA For N(3.4,2.1) min
                                   Free MA
                                   Use Provider For N(18.9,15.2) min
                                   Free Provider     1   Female_Patient_FollowUp
Follow_Up_Desk_1     FIRST 1  Move On Clinic_Net
 Female_Patient_FollowUp      Exam_Room_7        Use MA For N(3.4,2.1) min
                                   Free MA
                                   Use Provider For N(18.9,15.2) min
                                   Free Provider     1   Female_Patient_FollowUp
Follow_Up_Desk_1     FIRST 1  Move On Clinic_Net
 Female_Patient_FollowUp      Exam_Room_8_No_Vitals Use MA For N(3.4,2.1) min
                                   Free MA
                                   Use Provider For N(18.9,15.2) min
                                   Free Provider     1   Female_Patient_FollowUp
Follow_Up_Desk_1     FIRST 1  Move On Clinic_Net
 Female_Patient_FollowUp      Follow_Up_Desk_1     Use MA For 3 min
                                   Free MA           1   Female_Patient_FollowUp      EXIT
FIRST 1  INC vPatient_Count
 Female_Patient_Only_Sono      CheckIn_Station_1     GRAPHIC 1
                                   If aForms_Done=1 Then
                                   {
                                         Wait N(1,.2) min
                                   }
                                   Else
                                   {
                                         Wait N(2,.5) min
                                   }
                                                 1   Female_Patient_Only_Sono      Waiting_Room_A
FIRST 1  Move On Clinic_Net
 Female_Patient_Only_Sono      Waiting_Room_A       aTotal_time_waiting_room = Clock()
```

1 Female_Patient_Only_Sono Exam_Room_1
FIRST 1 Move with MA
Female_Patient_Only_Sono Exam_Room_2
FIRST Move with MA
Female_Patient_Only_Sono Exam_Room_3
FIRST Move with MA
Female_Patient_Only_Sono Exam_Room_4
FIRST Move with MA
Female_Patient_Only_Sono Exam_Room_5
FIRST Move with MA
Female_Patient_Only_Sono Exam_Room_6
FIRST Move with MA
Female_Patient_Only_Sono Exam_Room_7
FIRST Move with MA
Female_Patient_Only_Sono
Exam_Room_8_No_Vitals FIRST Move with MA
Female_Patient_Only_Sono Exam_Room_1 Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Exam_Room_2 Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Exam_Room_3 Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Exam_Room_4 Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Exam_Room_5 Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Exam_Room_6 Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Exam_Room_7 Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Exam_Room_8_No_Vitals Use MA For N(4.6,3.9) min
1 Female_Patient_Only_Sono Sono_Q
FIRST 1 Move On Clinic_Net
Female_Patient_Only_Sono Sono_Q

Graphic 1 1 Female_Patient_Only_Sono Sonogram_Room
FIRST 1 Move with MA then free
Female_Patient_Only_Sono Sonogram_Room Use Sonogram_Doctor For N(12.8,6.11) min
1 Female_Patient_Only_Sono Follow_Up_Desk_1
FIRST 1
Female_Patient_Only_Sono Follow_Up_Desk_1 Use MA For 3 min
Free MA 1 Female_Patient_Only_Sono EXIT
FIRST 1 INC vPatient_Count

```
********************************************************************************
*                        Arrivals                          *
********************************************************************************

 Entity   Location        Qty Each            First Time Occurrences Frequency  Logic
 -------- ---------------- --------------------- ---------- ----------- ---------- ------------
 PATIENT  Patient_Entrance 76; Patient_Monday    0         1          24
 PATIENT  Patient_Entrance 78; Patient_Tuesday   0         1          24
 PATIENT  Patient_Entrance 84; Patient_Wednesday 0         1          24
 PATIENT  Patient_Entrance 89; Patient_Thursday  0         1          24
 PATIENT  Patient_Entrance 61; Patient_Friday    0         1          24


********************************************************************************
*                        Attributes                          *
********************************************************************************

 ID                          Type         Classification
 ----------------------------- ------------ --------------
 aForms_Done                  Integer      Entity
 aProvider_CheckUp            Integer      Entity
 aTotal_time_waiting_room     Real         Entity
 aTotal_time_New_Only_Sono_Pati Real         Entity
 aPatient_Type                Integer      Entity


********************************************************************************
*                        Variables (global)                          *
********************************************************************************

 ID                Type         Initial value Stats
 ----------------- ------------ ------------- -----------
 vPatient_Count    Integer      0             Time Series
 Waitroom_count    Integer      0             Time Series
 Waitroom_Max      Integer      0             Time Series
 FollowUp_Count    Integer      0             Time Series
 FollowUp_Max      Integer      0             Time Series
 vPatient_Check_In Integer      0             Time Series
```

****
*   Arrival Cycles   *
****

ID	Qty / %	Cumulative	Time (Hours)	Value
Patient_Monday	Percent	Yes	5.0	66
			8.0	88
			10.0	100
Patient_Tuesday	Percent	Yes	5.0	33
			8.0	83
			10.0	100
Patient_Wednesday	Percent	Yes	5.0	60
			8.0	85
			10.0	100
Patient_Thursday	Percent	Yes	5.0	60
			8.0	92
			10.0	100
Patient_Friday	Percent	Yes	5.0	51
			8.0	87
			10.0	100
Distributed	Percent	Yes	1	10
			2	20
			3	30
			4	40
			5	50
			6	60
			7	70
			8	80
			9	90
			10	100

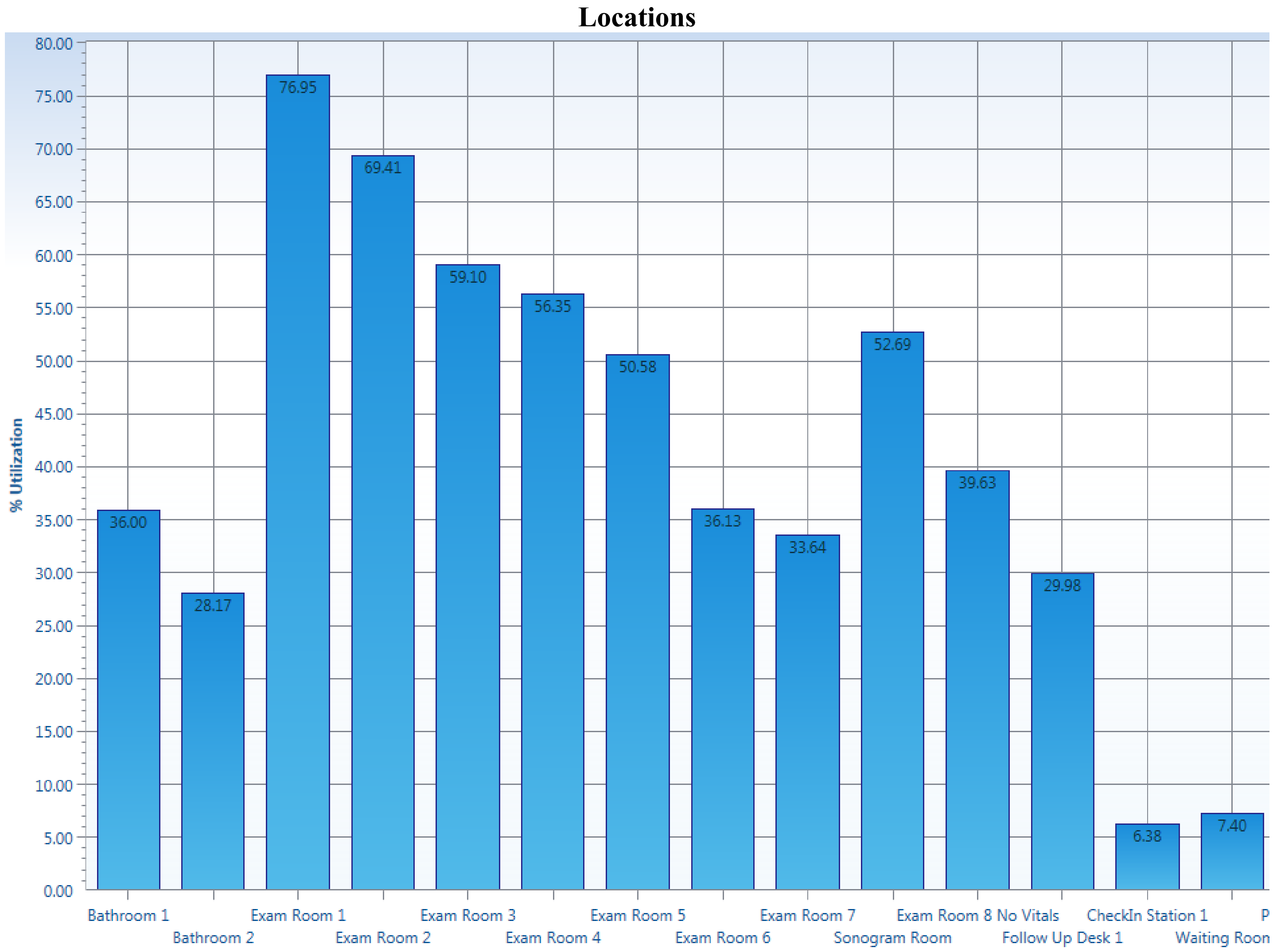
****
*   User Distributions   *
****

ID	Type	Cumulative	Percentage	Value
Patient_type	Discrete	No	12.0	1
			7.0	2
			72.0	3
			9.0	4
			0	5

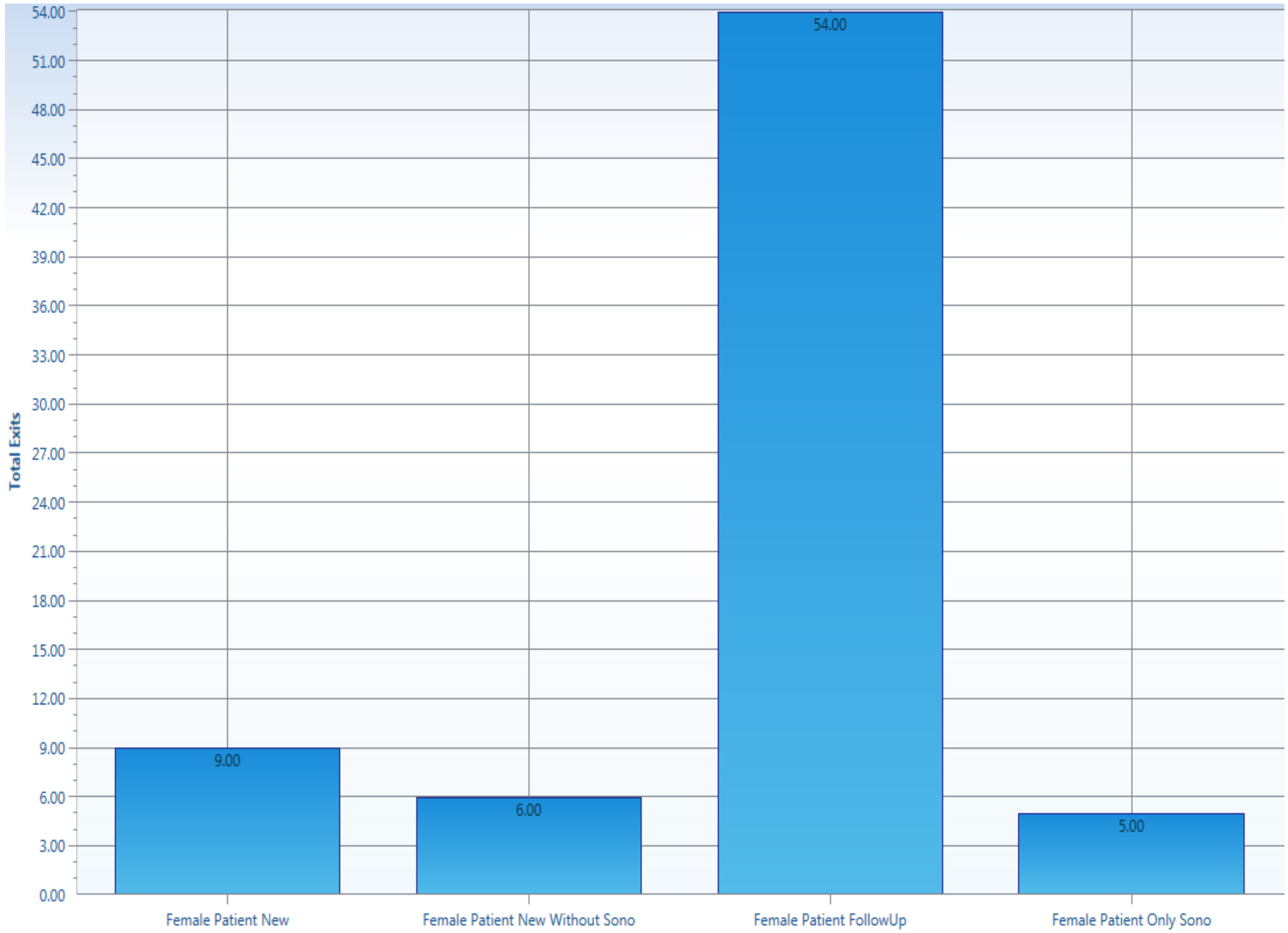
Med Model Output

The simulation was run individually by the day of the week as the arrival cycles were built that way. This output contains runs with 3 providers and 7 MA's.

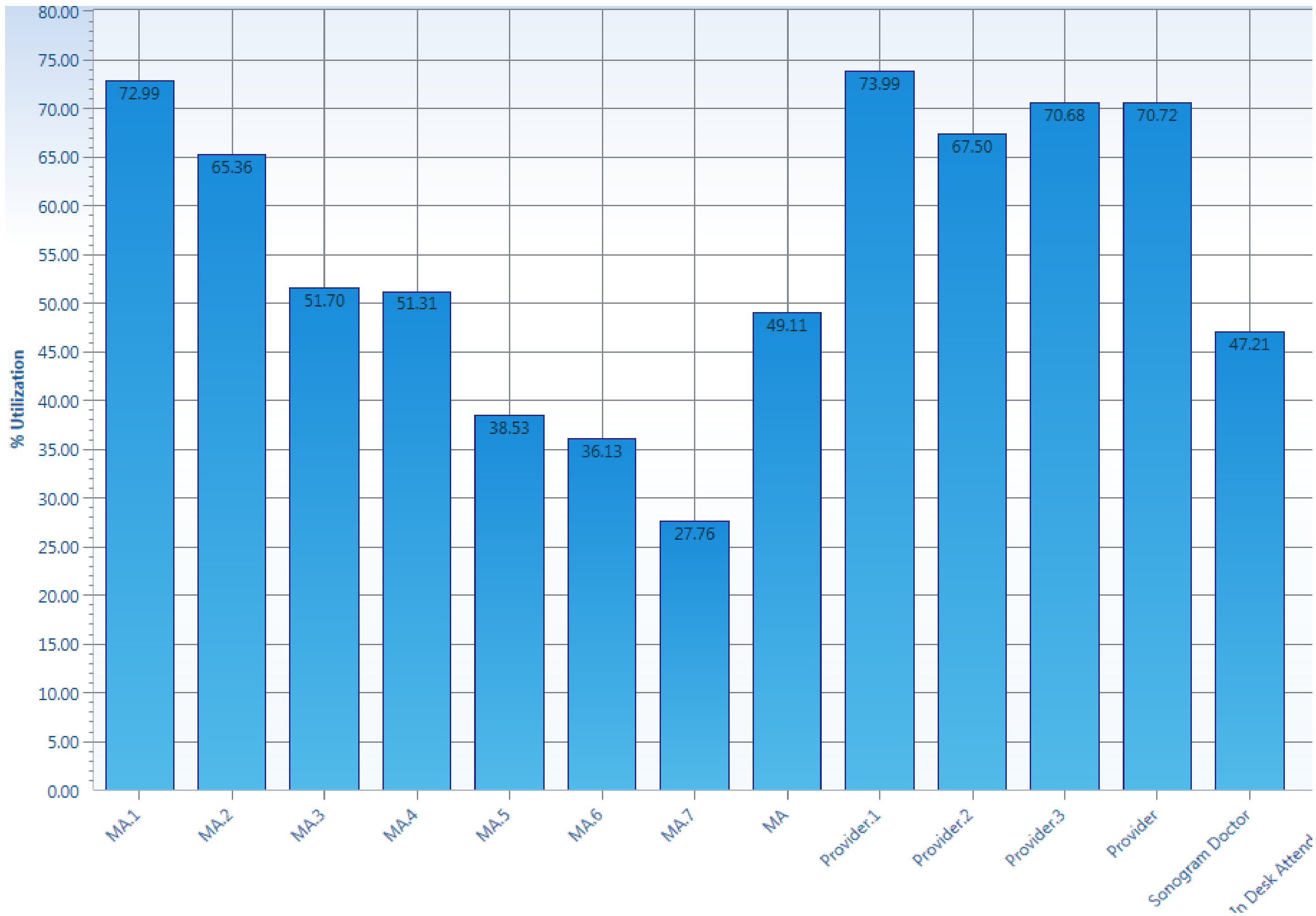
<u>Monday:</u>



Entities



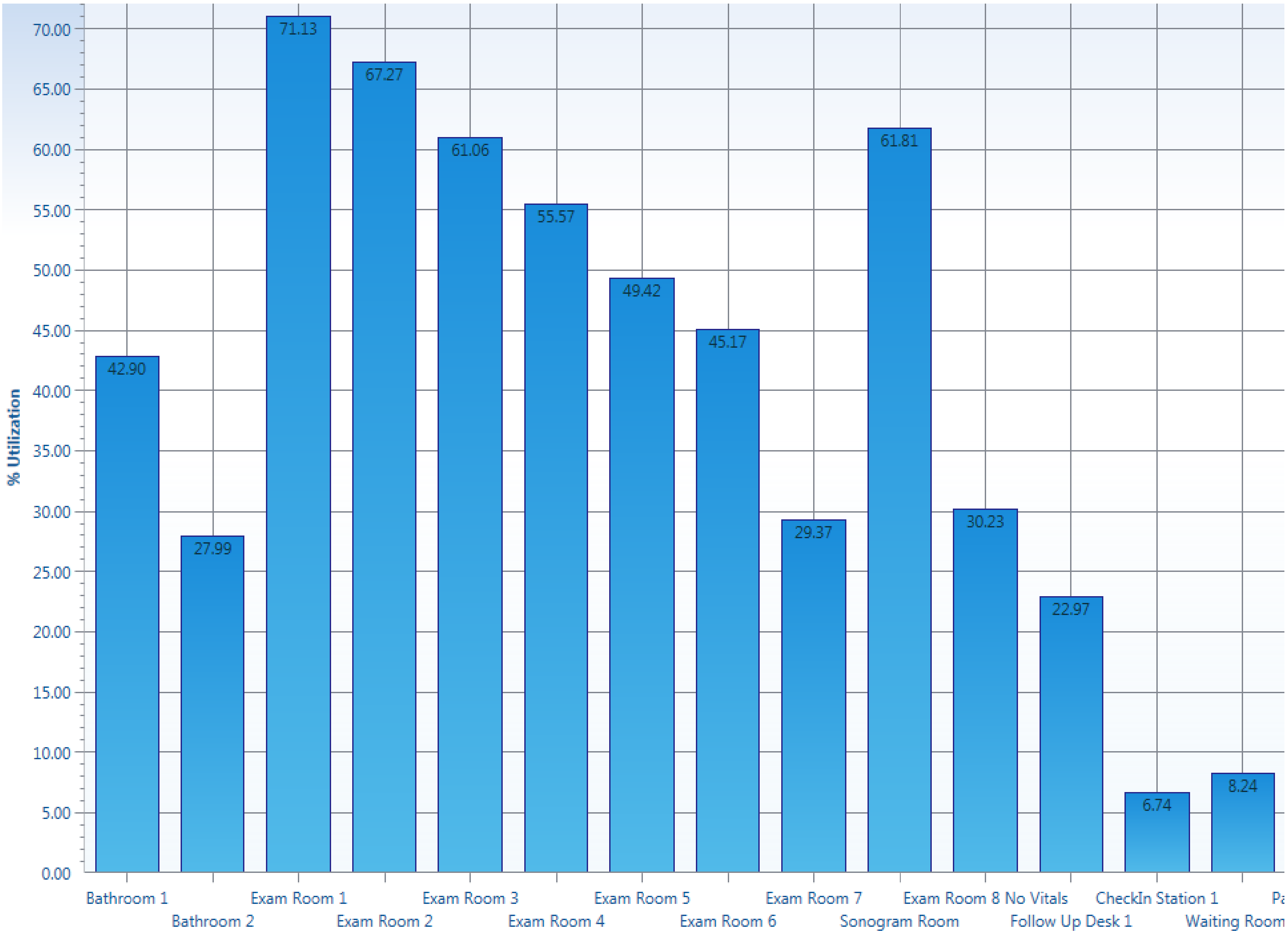
Total Exits
54.00
51.00
48.00
45.00
42.00
39.00
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
3.00
0.00
9.00
6.00
54.00
5.00
Female Patient New
Female Patient New Without Sono
Female Patient FollowUp
Female Patient Only Sono



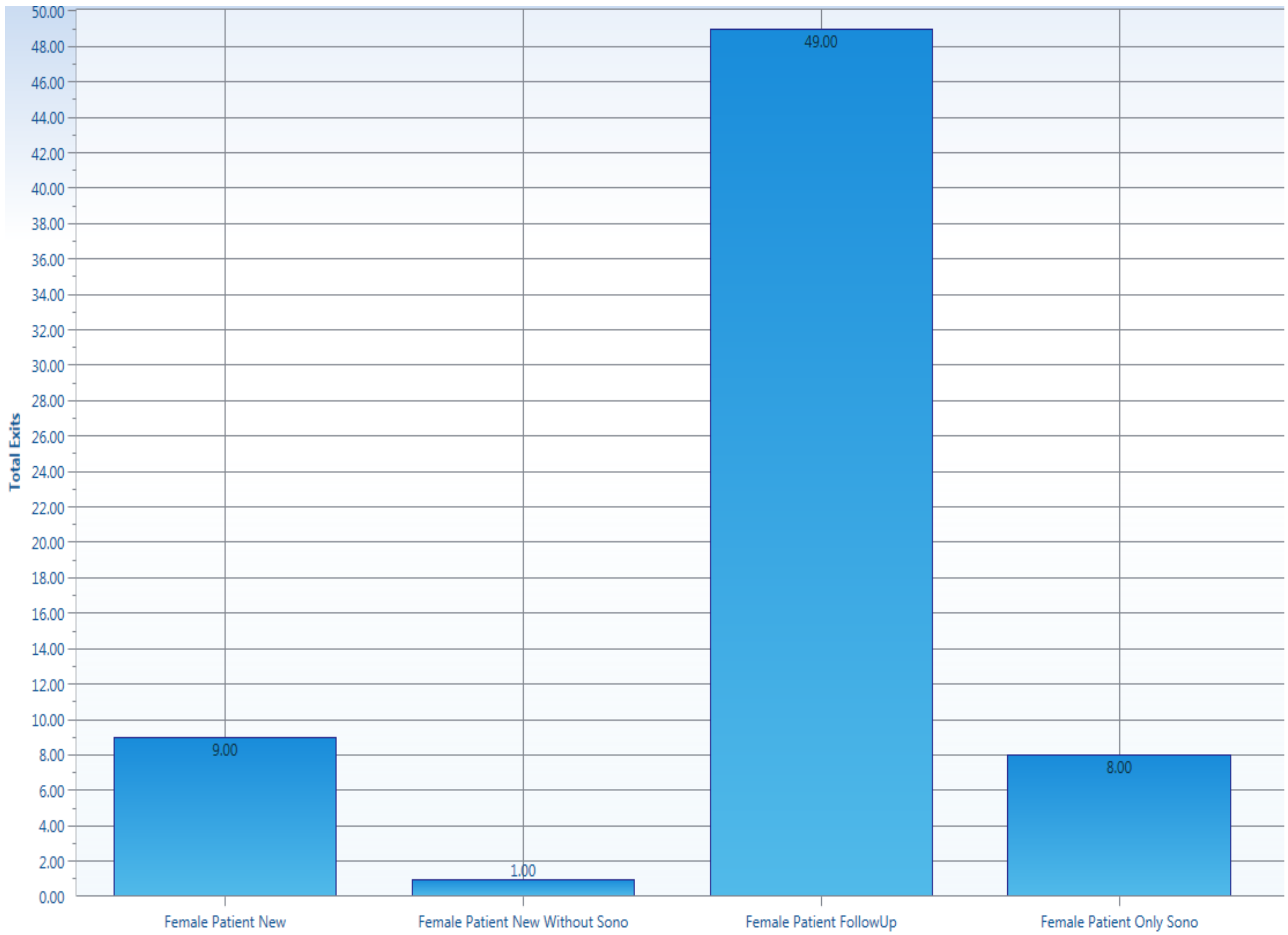
% Utilization
80.00
75.00
70.00
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
72.99
65.36
51.70
51.31
38.53
36.13
27.76
49.11
73.99
67.50
70.68
70.72
47.21
MA.1
MA.2
MA.3
MA.4
MA.5
MA.6
MA.7
MA
Provider.1
Provider.2
Provider.3
Provider
Sonogram Doctor

Tuesday:

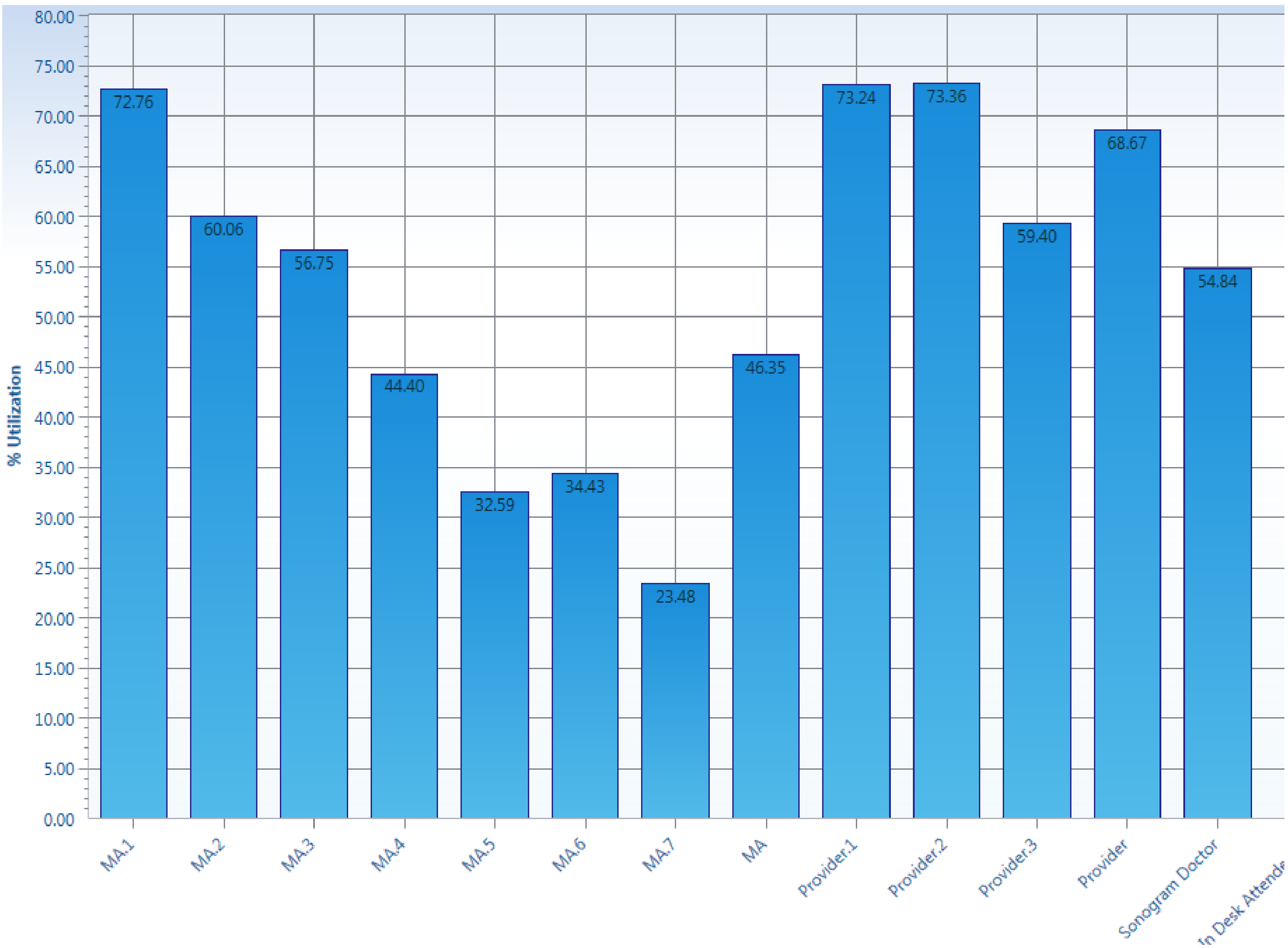
Locations



Entities

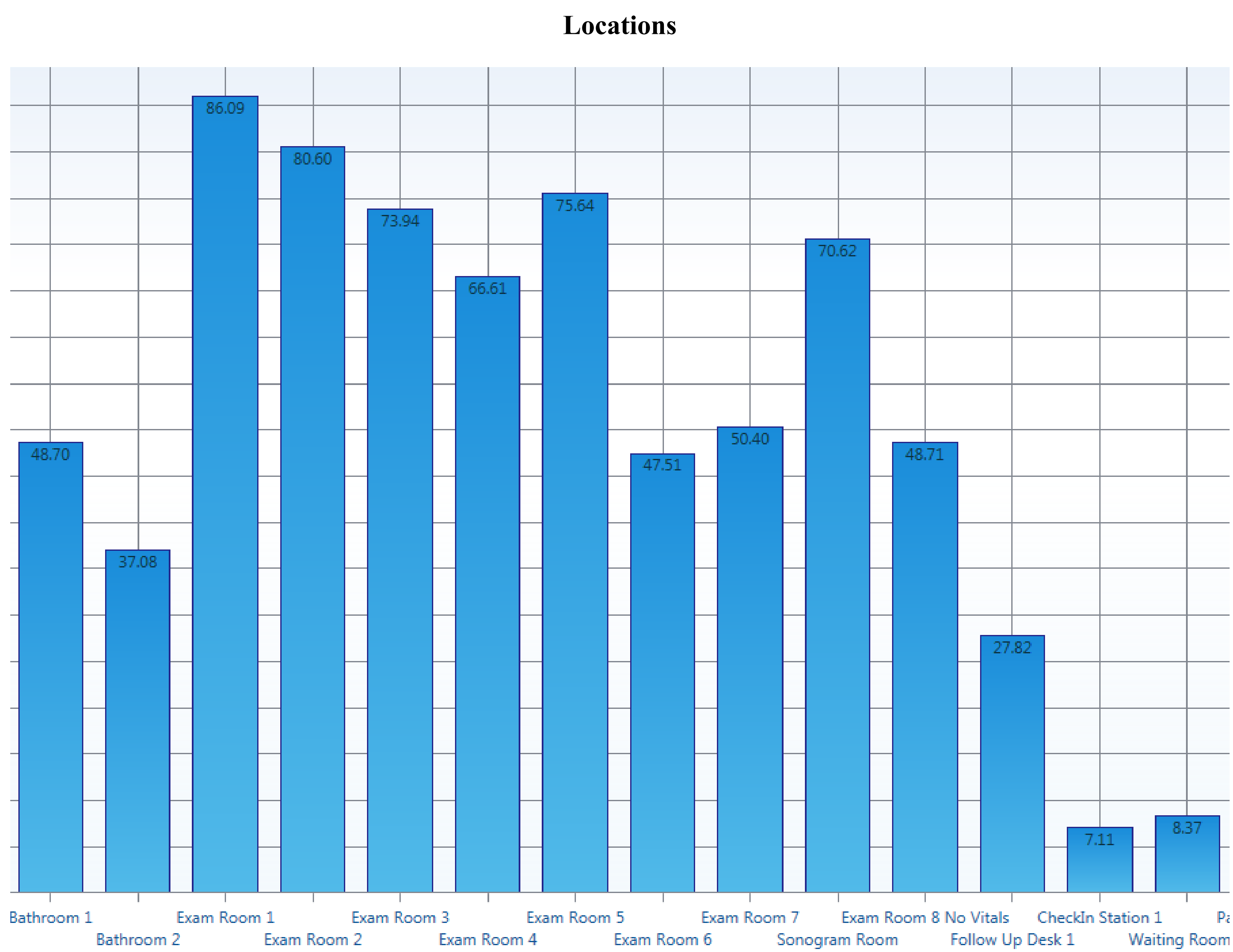

Total Exits
50.00
48.00
46.00
44.00
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
9.00
1.00
49.00
8.00
Female Patient New
Female Patient New Without Sono
Female Patient FollowUp
Female Patient Only Sono

Resources

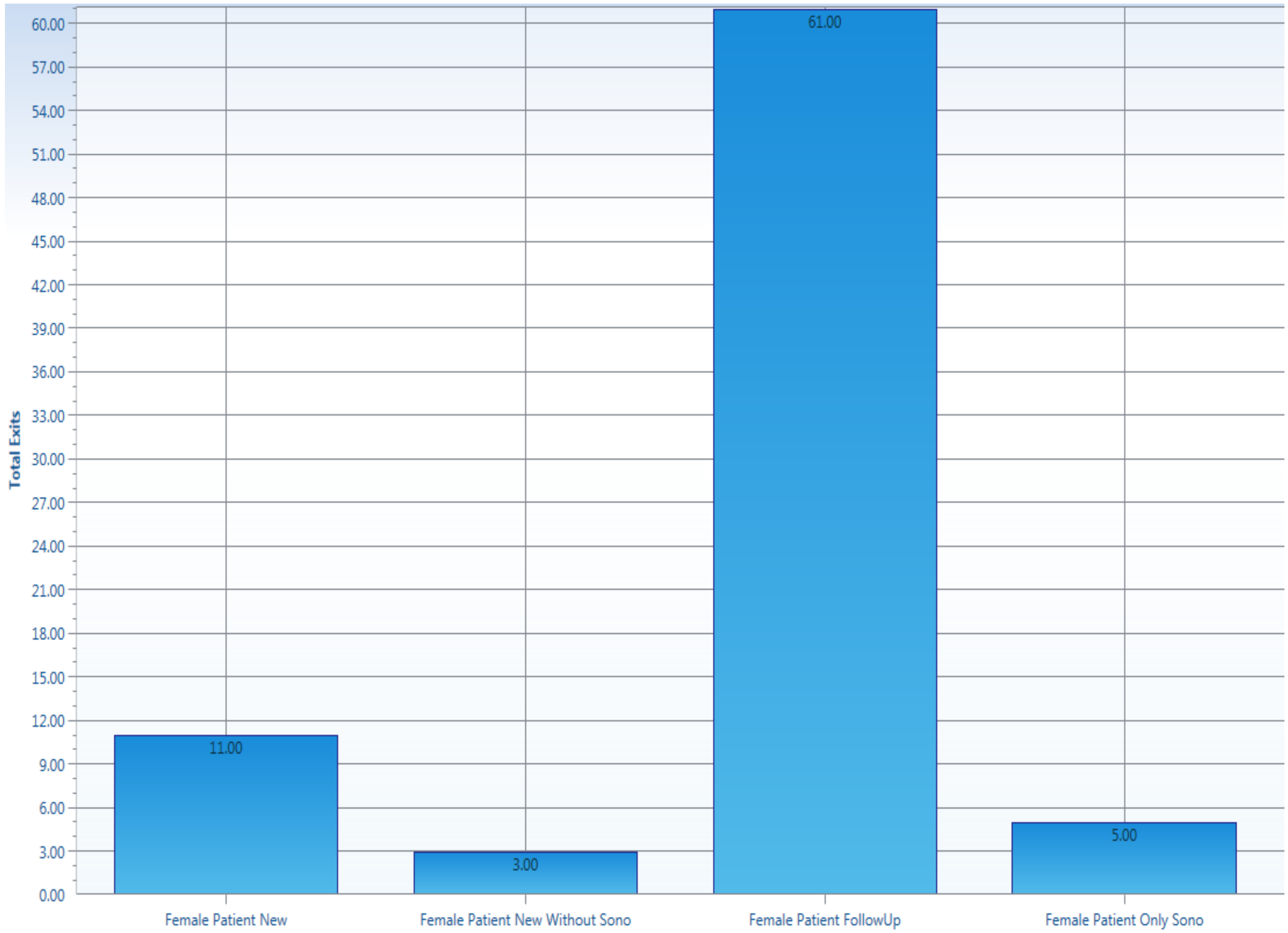


% Utilization
80.00
75.00
70.00
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
72.76
60.06
56.75
44.40
32.59
34.43
23.48
46.35
73.24
73.36
59.40
68.67
54.84
MA.1
MA.2
MA.3
MA.4
MA.5
MA.6
MA.7
MA
Provider.1
Provider.2
Provider.3
Provider
Sonogram Doctor

Wednesday:

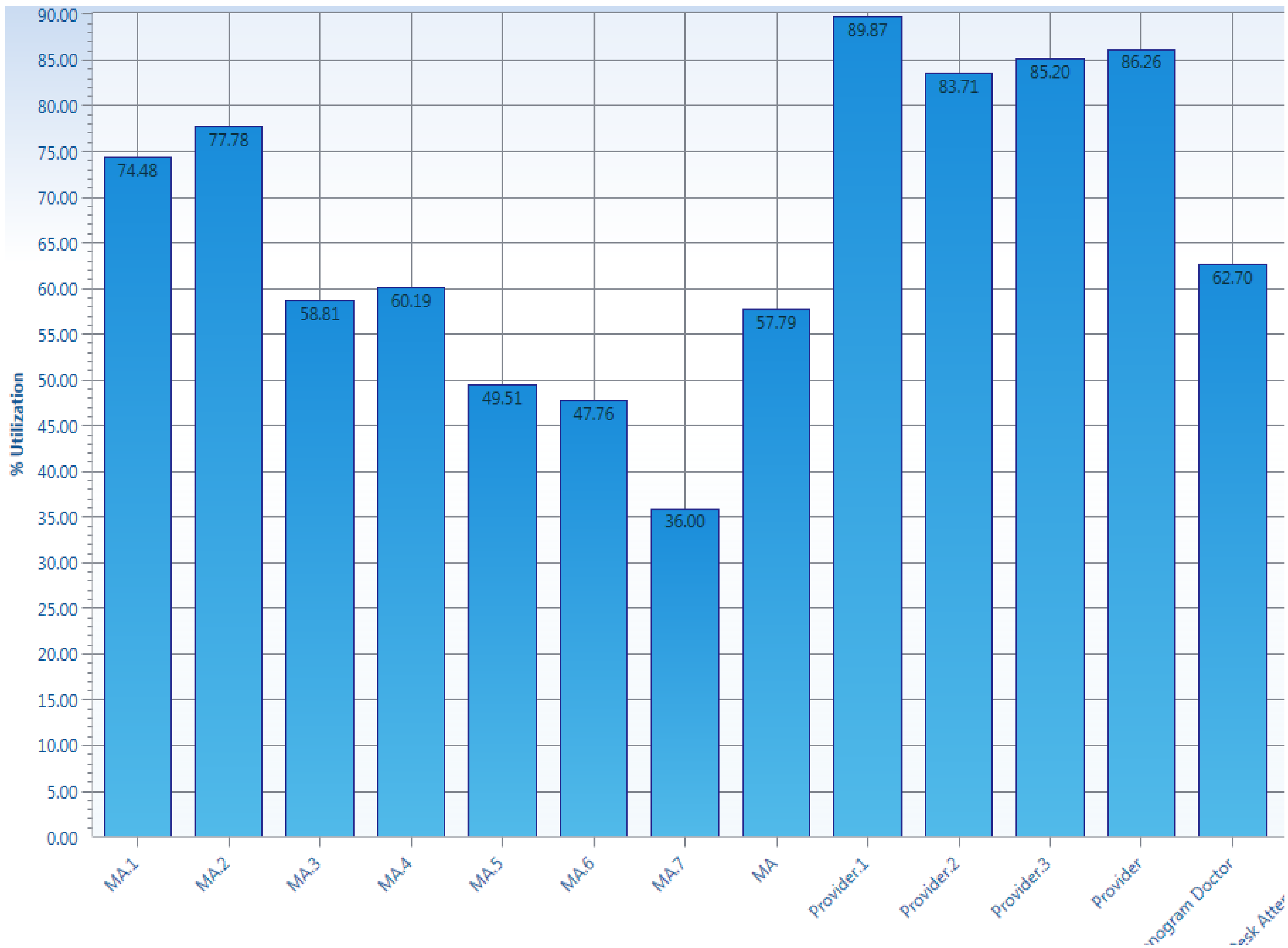

Locations
86.09
80.60
73.94
66.61
75.64
70.62
48.70
37.08
47.51
50.40
48.71
27.82
7.11
8.37
Bathroom 1
Bathroom 2
Exam Room 1
Exam Room 2
Exam Room 3
Exam Room 4
Exam Room 5
Exam Room 6
Exam Room 7
Sonogram Room
Exam Room 8 No Vitals
Follow Up Desk 1
CheckIn Station 1
Waiting Room

Entities



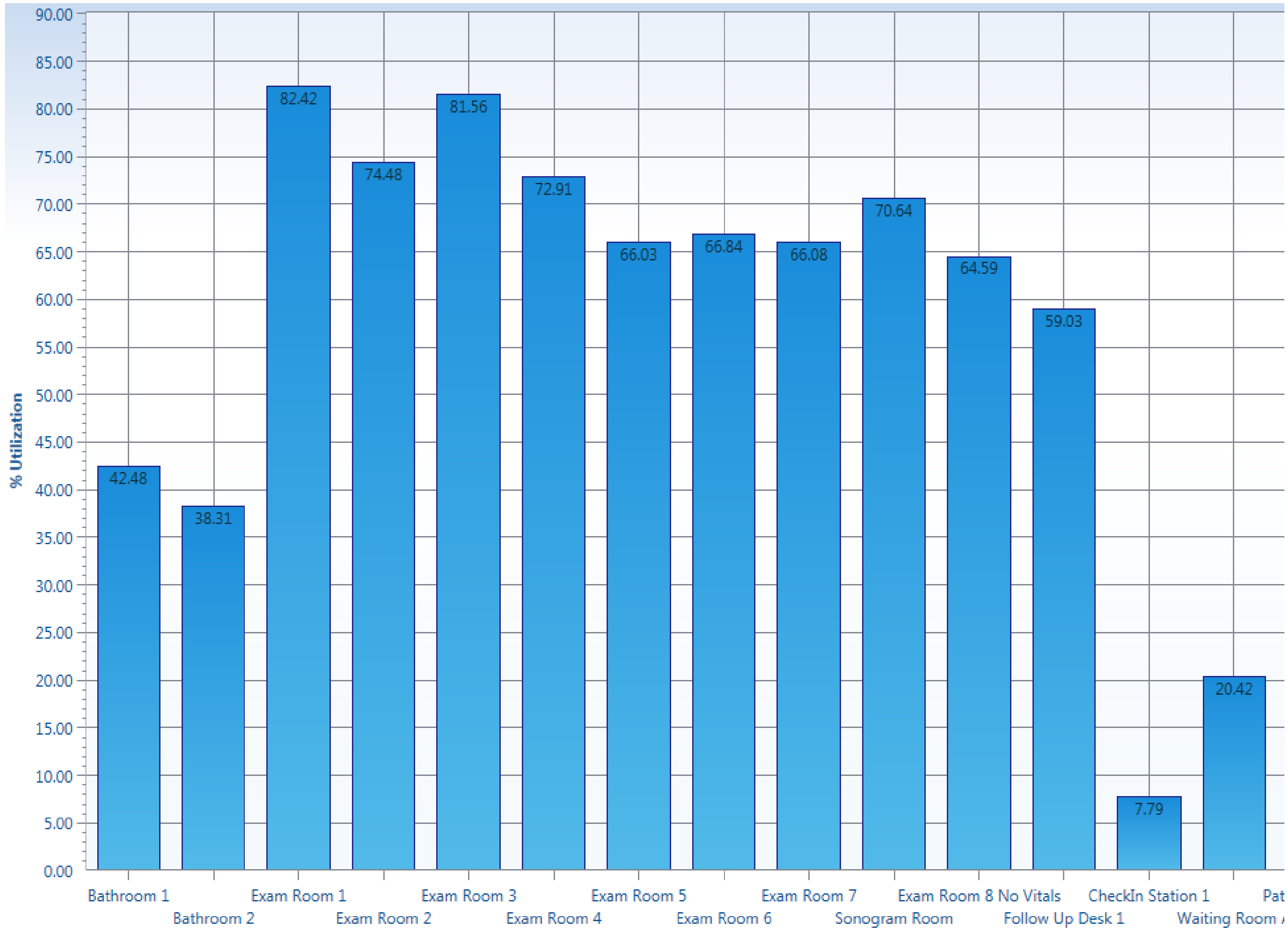
Total Exits
60.00
57.00
54.00
51.00
48.00
45.00
42.00
39.00
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
3.00
0.00
11.00
3.00
61.00
5.00
Female Patient New
Female Patient New Without Sono
Female Patient FollowUp
Female Patient Only Sono

Resources

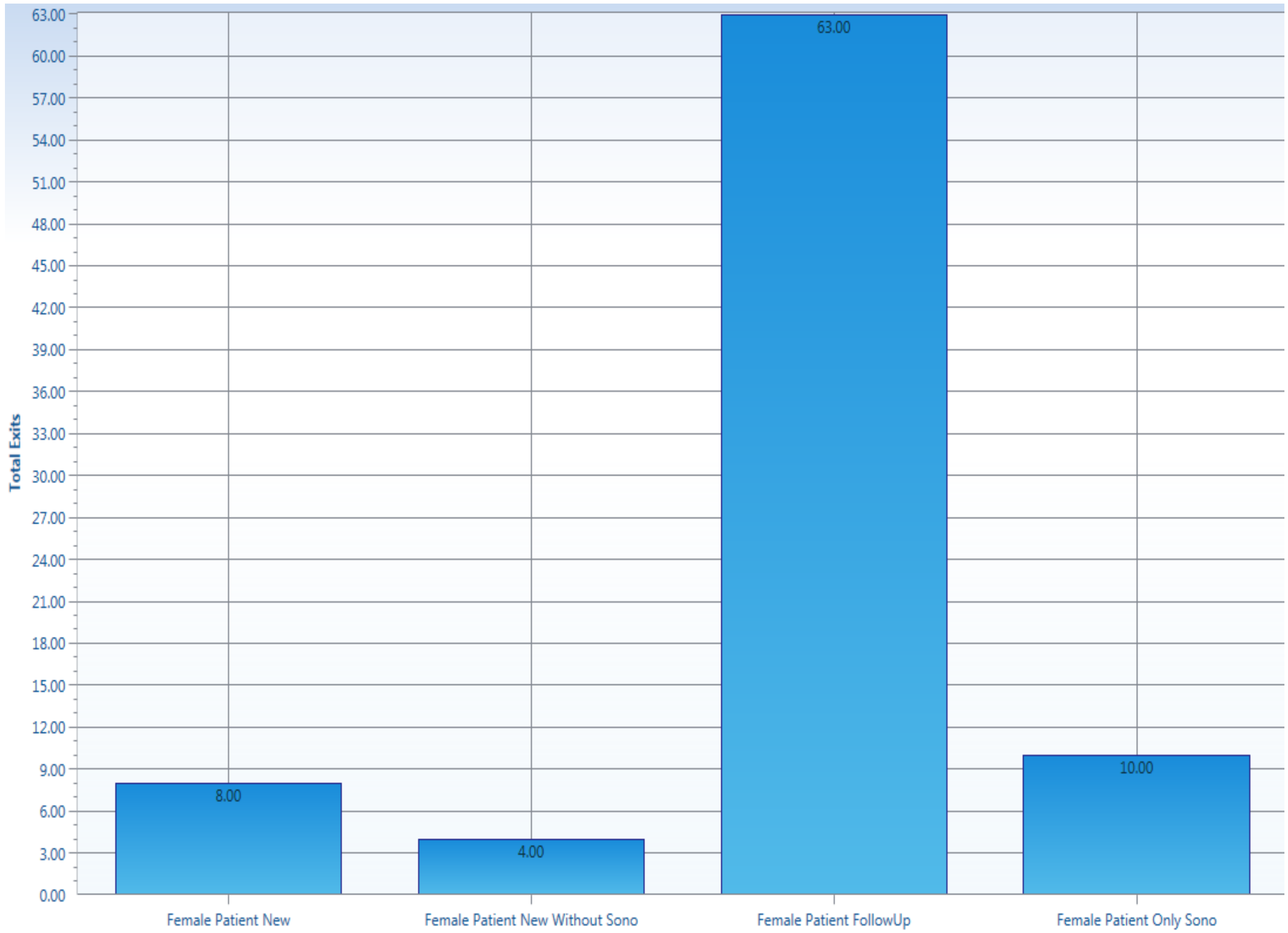

% Utilization
90.00
85.00
80.00
75.00
70.00
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
74.48
77.78
58.81
60.19
49.51
47.76
36.00
57.79
89.87
83.71
85.20
86.26
62.70
MA.1
MA.2
MA.3
MA.4
MA.5
MA.6
MA.7
MA
Provider.1
Provider.2
Provider.3
Provider

Thursday:

Locations

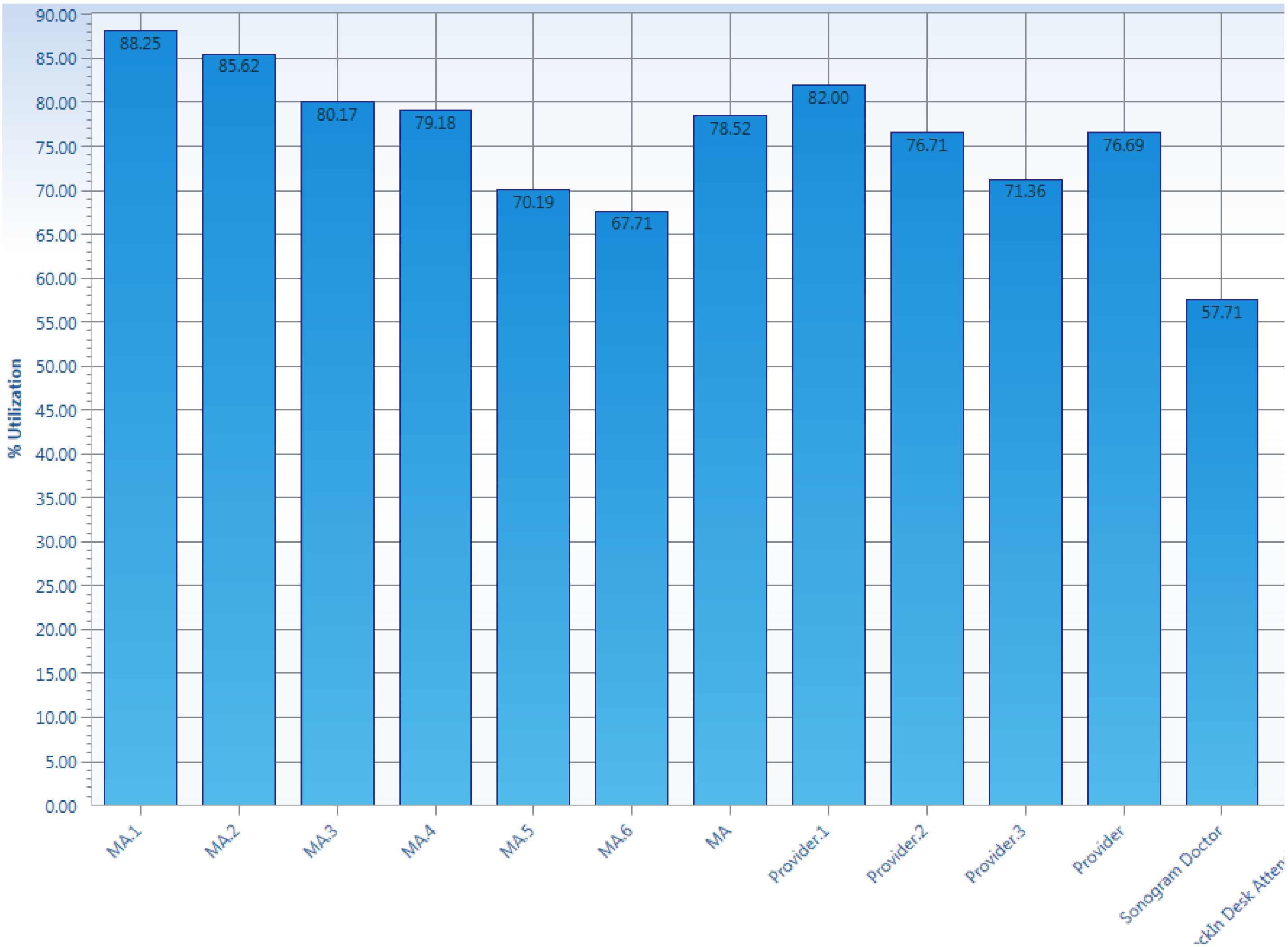


Entities



Total Exits
63.00
60.00
57.00
54.00
51.00
48.00
45.00
42.00
39.00
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
3.00
0.00
8.00
4.00
63.00
10.00
Female Patient New
Female Patient New Without Sono
Female Patient FollowUp
Female Patient Only Sono

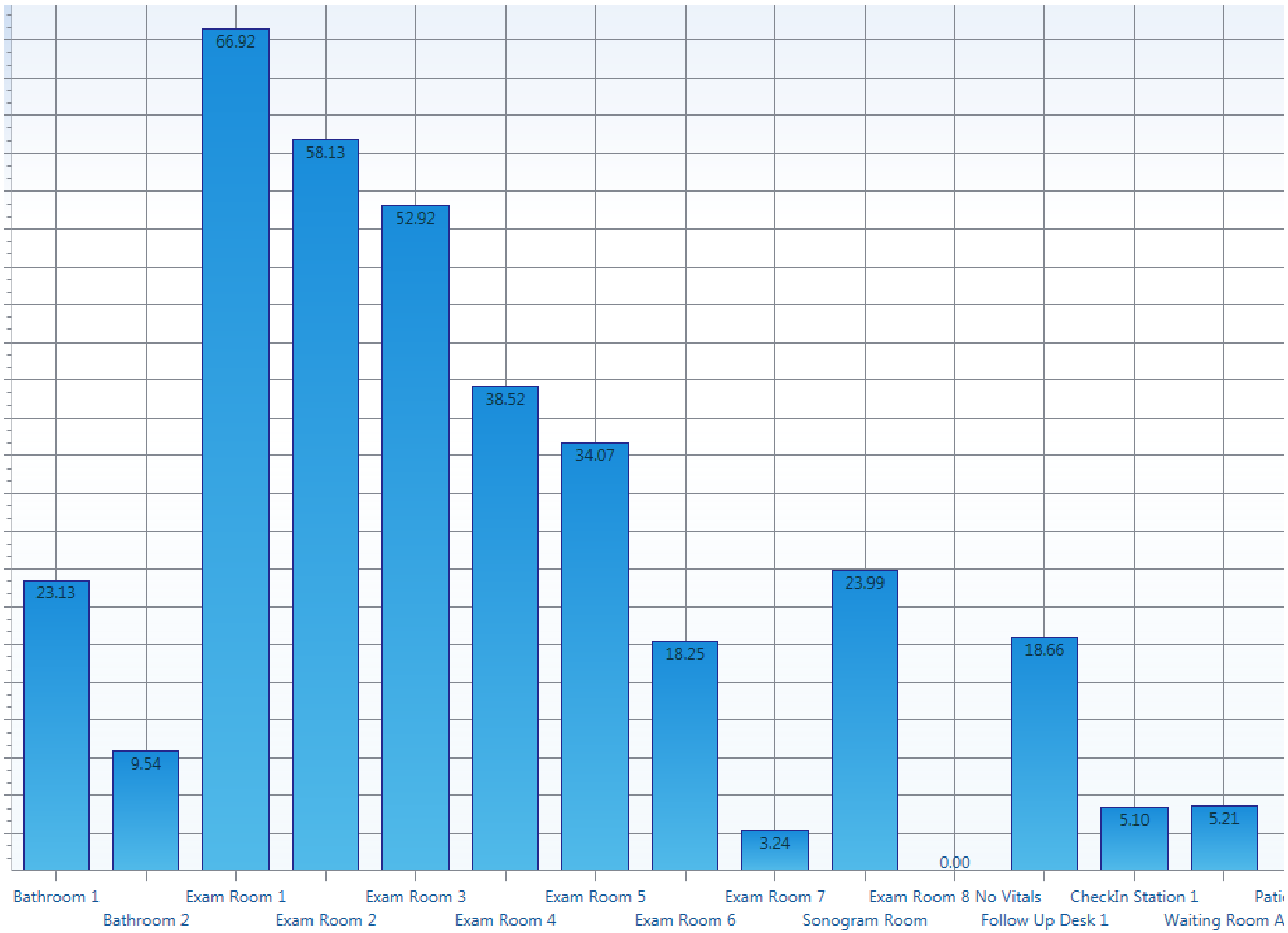
Resources



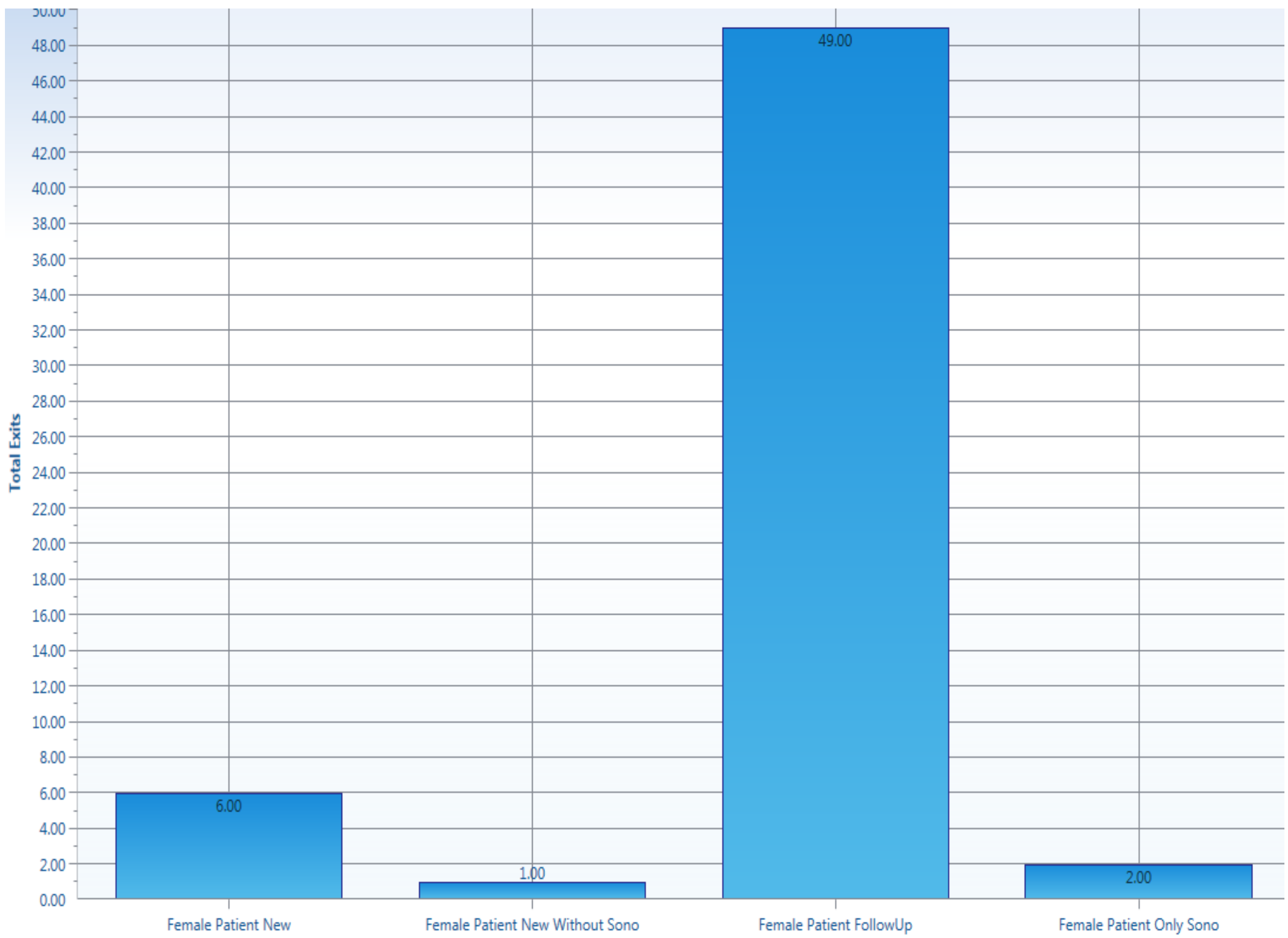
% Utilization
90.00
85.00
80.00
75.00
70.00
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
88.25
85.62
80.17
79.18
70.19
67.71
78.52
82.00
76.71
71.36
76.69
57.71
MA.1
MA.2
MA.3
MA.4
MA.5
MA.6
MA
Provider.1
Provider.2
Provider.3
Provider
Sonogram Doctor

Friday

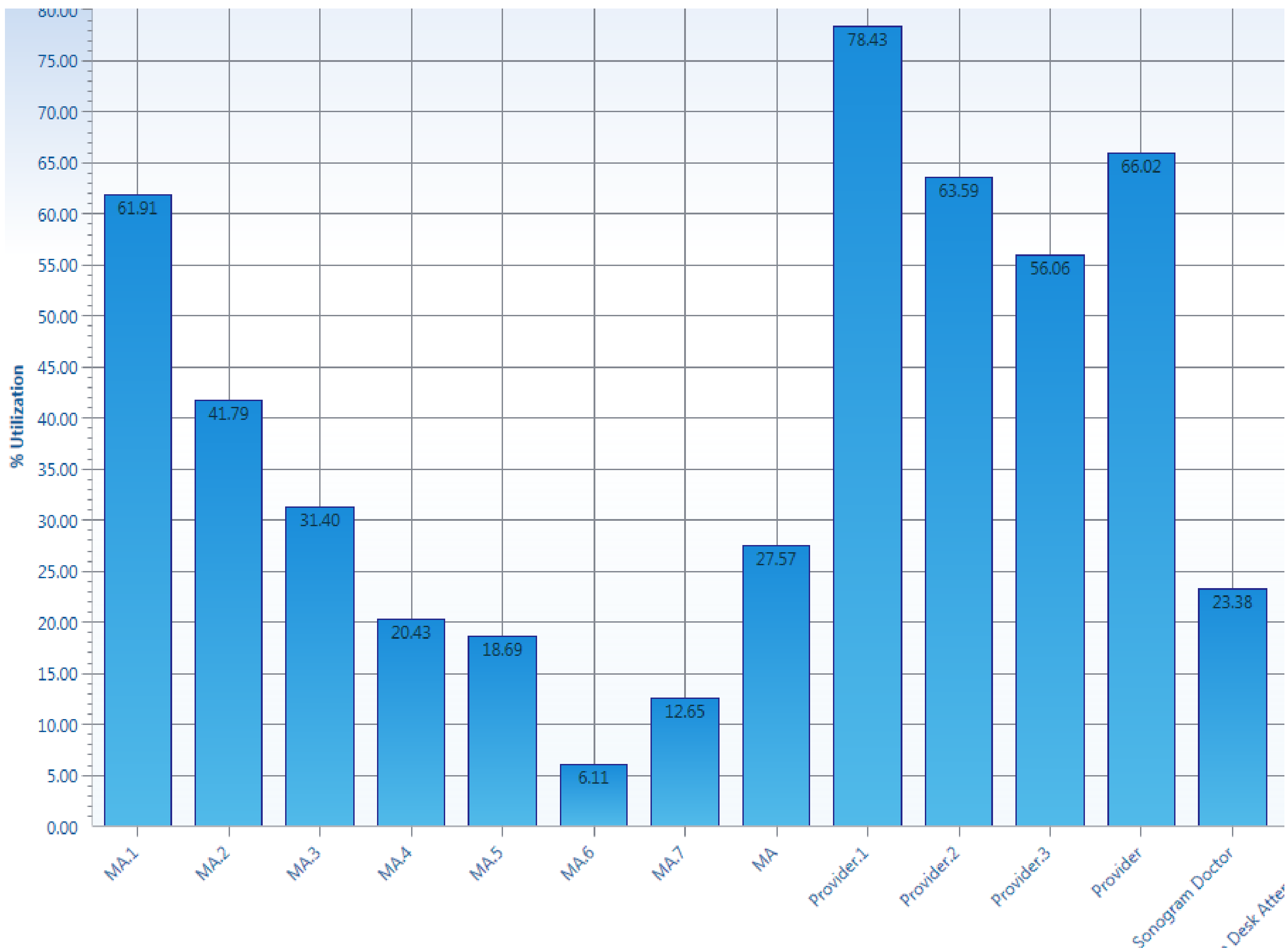
Locations



Entities


50.00
48.00
46.00
44.00
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Total Exits
6.00
1.00
49.00
2.00
Female Patient New
Female Patient New Without Sono
Female Patient FollowUp
Female Patient Only Sono

Resources



% Utilization
80.00
75.00
70.00
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
61.91
41.79
31.40
20.43
18.69
6.11
12.65
27.57
78.43
63.59
56.06
66.02
23.38
MA.1
MA.2
MA.3
MA.4
MA.5
MA.6
MA.7
MA
Provider.1
Provider.2
Provider.3
Provider
Sonogram Doctor