University of Michigan Health System

Analysis of the Intake Process in the Cardiovascular Center Clinic

FINAL REPORT

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EXECUTIVE SUMMARY

The Cardiovascular Center (CVC) of the University of Michigan Health System adopted a new electronic medical record system, MiChart, in August 2012. To effectively use MiChart, a new patient intake process was created. According to the clinic manager, this new intake process causes delays in patients’ access to the clinic, increases the medical assistant (MA) workload, affects the accuracy of patients’ chart in the medication reconciliation, and creates lapses in communication and information sharing. To ensure the clinic is meeting meaningful use requirements, the new intake process requires that MAs review the patient’s medications; medical, family and social histories; and immunizations before the patient sees the provider as well as taking vital signs. These additions to the process are causing the intake process to be longer than previously, resulting in staff and patient dissatisfaction.

In the new process there are two MA teams: rooming and intake. The intake team collects vitals, reviews patient’s medications, medical, family and social histories, and immunizations. The rooming team brings patients to the exam rooms where they perform any pre-exam procedures such as EKGs and immunizations. The separation of the MAs is creating a gap in communication among the staff. In addition, the rooming team experiences more downtime than the intake team. The complexity and lack of standardization of the intake process is resulting in MA, provider and patient dissatisfaction.

Leaders of the CVC asked a team of IOE 481 students to analyze the current intake process, identify bottlenecks and communication lapses, and determine an alternative patient intake process. The alternative process is expected to reduce staff downtime, improve workflow, and decrease the total intake time for patients, while still meeting meaningful use requirements.

Methodology

The team performed eight tasks to evaluate and improve the current intake process at the clinic.

- **Completed a literature search.** First, the team completed a literature search to prepare for initial client meetings. The team focused their search on material relating to the CVC and MiChart from *UMHS Headlines*. The literature found provided background on the CVC, previous work on the process, and information regarding MiChart.

- **Conducted interviews with eight MAs and four providers.** The team interviewed four intake and four rooming MAs to understand where the gaps in communication were occurring. In addition, the team interviewed four providers to determine which “first-time quality” errors were the most significant to providing the best patient care. The team evaluated both types of interviews by identifying common responses among those that were interviewed.

- **Performed time studies on the intake process for 30 patients.** Each member of the team observed and timed 10 patients from the time an intake MA greeted the patient until the rooming MA delivered the patient folder to the provider. The process was broken down into five activities: intake time, time reviewing medications, waiting time, rooming time and time for pre-exam procedures. The times for each activity were analyzed using Stat::fit’s Auto::Fit function to determine the proper statistical distributions. These distributions were then used in the simulations.

- **Conducted a random beeper test with MAs.** The random beeper test quantified the percentage of time the MAs are with patients and without the patients. Six MAs (three in
rooming and three in intake) were given beepers and a ticker sheet each day for two weeks. The ticker sheet was broken up by time and activity. When the beeper went off the MAs documented the activity they were performing at that time. For each time of the day, the team calculated the value added time and the non-value added time.

- **Evaluated “first-time quality” of patient charts.** Following the provider interviews the team created a review card that would allow providers to document any significant errors in a patient’s chart. The team identified eight providers to participate in the study. The study was used to determine which areas of a patient’s chart were being filled out incorrectly and to determine how frequently those errors occur.

- **Determined arrival cycles of patients.** The team was provided an Excel file with the times of patient arrivals from the coordinator. This patient arrival report contained data for two weeks, Monday through Friday. The patient arrivals were broken down by hour to determine the average number of patient arrivals per hour. This information was used in the simulations.

- **Simulated the current state and alternate scenarios.** The team used the times from the time studies to create simulations for the current state and alternate scenarios. The team simulated two alternative scenarios: all MAs on one team and current process with no assigned exam rooms for providers. Each scenario was run and compared to the current state. The metrics involved were a patient’s total time in the clinic, time waiting for an exam room to be available, and MA utilization.

- **Distributed communication and MiChart surveys.** The team distributed 10 Communication & MiChart surveys to both the intake and rooming MAs and received 7 completed surveys. The surveys acquainted the MAs with the most common suggestions from the interviews and quantified the MAs’ receptions to the suggestions.

**Findings**

The analysis of the current state data revealed the following findings:

- **Significant “first-time quality” errors.** The provider interviews highlighted that errors regarding a patient’s medications were the most significant to providing patient care. A patient’s smoking history, vital signs and immunizations were also important to patient care. These errors were all included in the “first-time quality” review form.

- **Frustrations with MiChart and communication gaps.** The MA interviews highlighted that there are many frustrations with MiChart’s functions and communication when another MA team needs help.

- **Average total intake process time - 30 minutes.** After completing the time studies and analyzing the data, the team determined that the average total intake process time was 30 minutes with a standard deviation of 17 minutes. The statistical distributions for intake time, rooming time, waiting time, EKG time, and provider time were determined and used in the simulation.

- **Times with and without patients are within 2%.** The percentage of time overall that MAs spend with patients was 47% and without the patient was 48%. The MAs are spending 5% of their time on breaks.

- **“First-time quality” review has no statistical significance.** The team received 33 “first-time quality” review cards from the providers; only one error was documented. The team determined that the sample size of 33 review cards contained a 6% margin of error at 95% confidence.
• **Average number of patient arrivals per day - 184.** Using the data from the patient arrival report, the team determined that on average 184 patients arrive at the clinic each day and the most patients arrive between 9:00am and 11:00am, and 1:00pm and 2:00pm.

• **The total time in clinic for each scenario ranges from 95 to 105 minutes.** After simulating each scenario, the team found that on average the total times spent in the clinic in the current state, one-team, and two-team with no assigned exam rooms were 97 minutes, 105 minutes, and 95 minutes respectively.

• **Mass MA pages and MiChart note section are most helpful.** After collecting the surveys from the MAs, the team determined the top communication and MiChart suggestions. For clinic communication 86% found mas MA pages useful to ask for help between pods. For MiChart updated 57% stated that a note section for patient needs would be the most useful.

**Conclusions & Recommendations**

Following the teams studies and findings, the team has determined several conclusions and recommendations to improve the intake process at the clinic. The team’s conclusions and recommendations revolve around “first-time quality,” team communication, MiChart updates, MA time allocation, and an alternative process.

• “**First-time quality” continued improvement.** The team has concluded that the perceived number of errors occurring in the clinic is higher than is actually occurring. However, when errors do occur, they significantly affect a patient’s care. The team recommends that the clinic continue “first-time quality” testing and have the lead MA or nursing supervisor fill out a Qualtrix survey to document the error.

• **Increased communication across teams.** From the interviews with the MAs the team discovered that the MAs do not know the most efficient way to ask for help and need a means to get a basic overall understanding of the clinic status during the day. Thus the team recommends that the MAs utilize mass pages specifically to ask for help. In addition, the team recommends that each pod begin a daily lean huddle to discuss the state of the clinic each day. The huddle will be facilitated by the lead MA and guided by a daily metrics board.

• **MiChart updates to better clinic flow.** The team has concluded that MiChart is causing delays in the clinic because MAs cannot batch order EKGs per provider, document patient needs, or tell when another user is viewing a patient’s chart. The team recommends that clinic management work with Epic to make the necessary MiChart updates.

• **Reallocating MA time to minimize downtime.** The team has concluded from the beeper test that Tuesday and Wednesdays midday are the busiest times in the clinic. Additionally, that Thursday and Friday afternoons are the slowest. The team recommends that management investigate shifting some MA resources from Thursday and Friday afternoons to Tuesday and Wednesday midday to better accommodate the higher patient volume.

• **An alternative intake process to improve intake time.** After simulating the one-team and two-team scenarios, the team has concluded that the two-team process allows for a faster intake process. In order to also increase staff and patient satisfaction as well as team communication the team recommends that the clinic use a two-team system with a “float MA.” The “float MA” would not be assigned to a team or pod but would respond to the mass MA pages to offer help to the pods.
INTRODUCTION

The Cardiovascular Center (CVC) of the University of Michigan Health System “brings together highly skilled” (“EHR Incentive Programs,” CMS.org) healthcare professionals who are committed “to providing the most comprehensive heart and vascular care” to patients. In August 2012, the outpatient clinic in the CVC adopted a new electronic medical record system, MiChart. MiChart allows the clinic to achieve the meaningful use requirements for the Medicare and Medicaid Incentive Programs, standards set by the Center for Medicare and Medicaid Services. When healthcare providers prove that they have met these standards, they earn monetary incentives.

To effectively use MiChart and to achieve the meaningful use requirements, a new patient intake process was created for the clinic; however, the clinic is experiencing delays due to the new process. According to the clinic manager, the new process increases the medical assistant (MA) workload and causes lapses in communication and information sharing. Leaders in the CVC have asked a team of IOE 481 students to analyze the current intake process at the clinic to determine where the bottlenecks and communication lapses are occurring. They have also asked the team to determine an alternate process. The alternate process should reduce staff downtime, improve the intake process workflow, and decrease the total intake time for patients. The purpose of this report is to present the team’s methods, findings, conclusions and recommendations.

BACKGROUND

Since adopting a new electronic medical record system, MiChart, in August 2012, the clinic in the CVC has been experiencing delays due to a new intake process for patients. MiChart and the current intake process allow the CVC to achieve meaningful use requirements for Medicare and Medicaid Incentive Programs. The leaders in the CVC estimated that the entire intake process took an average of 10 minutes per patient before the clinic switched to MiChart. In the old intake process, one medical assistant (MA) was paired with one provider, and the MA would intake all of the provider’s patients. A provider can be a physician, physician’s assistant or nurse. During the old process, the MA took vital signs and brought the patient to an exam room. After the provider had seen the patient and indicated to the MA what changes to make in the patient’s medication list, the MA would update the list. The medication update was often done at the end of clinic for all patients seen that day. However, the intake process changed when the center switched to MiChart. To ensure meaningful use, the current intake process requires that MAs review the patient’s medications before the patient sees the provider. In addition, in the intake process the MAs must now review and document the patient’s medical, family and social history; document current medications and immunizations; and take vital signs.

Process

A process map created by the team illustrates the general clinic intake process and is attached in Appendix A. This general process is used in all areas of the clinic. To reduce bottlenecks in the intake workflow, the MAs are split between two teams: intake and rooming. The teams are located in different areas in the clinic; intake MAs are located in the bays at the front of the clinic and rooming MAs are in the pods at the back of the clinic. A floor map of the clinic, which
illustrates the location of the bays and the pods, is provided in Appendix B. The floor map is not drawn to scale.

The intake MAs greet the patient in the waiting area and bring them to the intake bays. While with the patient, the intake MA collects information regarding the patient’s reason for the visit (chief complaint), the patient’s vital signs, and the patient’s health history. Then depending on room availability, the intake MA brings the patient to a room or back to the waiting area. While the intake MA is with the patient or while the patient is in the waiting room, a rooming MA prepares a room for the patient and then assigns the room to the patient on MiChart (populates the room). Once the patient is in a room, a rooming MA performs any pre-exam procedures, such as EKGs or immunizations. The MA then enters the patient’s health history into MiChart at the pod, pages the provider to communicate that the patient is ready, and puts the patient’s chart at the provider’s desk or in the provider’s team room.

**Dot System**

During the process, the staff utilizes MiChart’s dot system to communicate between MAs and providers. Table 1 below lists the dots, their significance, and the person who changes the dot colors.

<table>
<thead>
<tr>
<th>Dot Color</th>
<th>Meaning</th>
<th>Placed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>MA is performing vitals</td>
<td>Intake MA</td>
</tr>
<tr>
<td>Yellow</td>
<td>Patient is ready to be roomed</td>
<td>Intake MA</td>
</tr>
<tr>
<td>Green</td>
<td>Patient is ready to see provider</td>
<td>Rooming MA</td>
</tr>
<tr>
<td>Blue</td>
<td>In clinic procedures have been ordered</td>
<td>Automatic</td>
</tr>
</tbody>
</table>

**Historical Data**

An Excel data file from the time studies collected by a CVC Industrial Engineer in September 2012 was provided to the team. The data indicated that the current process takes around 20 minutes per patient on average but can take up to 40 minutes depending on the patient’s medical history. The leaders in the CVC have expressed their concerns with MiChart and the current intake process. They have noticed that the rooming MA team is experiencing more downtime than the intake team. They believe MiChart lacks data entry accountability, particularly in the medication reconciliation. These errors in medication reconciliation are affecting the quality of the patient’s chart after the intake process is finished. “First-time quality” is important particularly in Cardiology because the providers treat the patients’ needs primarily with medications. For this reason, the IOE 481 team observed and analyzed the Cardiology intake process; however, recommendations for the Cardiology intake process can apply to all intake processes in the clinic.
Key Issues
The following key issues are driving the need for this project:

- The lack of data entry accountability in medication reconciliation is affecting “first-time quality” and causing provider and MA dissatisfaction.
- The physical separation of the intake team from the rooming team is creating a gap in communication among the staff.
- The rooming team is experiencing more downtime than the intake team.
- The complexity and lack of standardization of the intake process is resulting in both MA and patient dissatisfaction.
- The intake process time is longer than before the clinic adopted the MiChart system causing staff and patient dissatisfaction.

Goals and Objectives
The primary goal of this project is to design a new intake process for the Cardiovascular Center (CVC) clinic. The new intake process will help the clinic with the following objectives:

- Improve “first-time quality” and meet meaningful use requirements
- Improve team communication
- Minimize MA downtime
- Increase patient and staff satisfaction with the intake process
- Reduce intake time

Project Scope
The scope of the project includes observation and analysis of the intake process for Cardiology patients at the CVC clinic. The intake process begins when the patient is first greeted by an intake MA and ends when the rooming MA delivers the patient’s chart to the provider.

The scope of the project excluded:
- The intake process for non-Cardiology patients
- The patient’s clinic visit after or before the intake process
- Changes to the staffing model
- Changes to the physicians’ schedules
- Monetary and budget considerations

DATA COLLECTION
The team collected information of the current state through a literature search, interviews, surveys, time studies, patient arrival data, “first-time quality” testing and random beeper test. The literature search prepared the team for initial client meetings by providing background on MiChart and the duties of the CVC clinic. Provider interviews were conducted to identify which “first-time quality” errors were the most significant to providing the best quality care. The identified “first-time quality” errors were utilized in the “first-time quality” testing to discover which areas of a patient’s chart are filled out incorrectly and how frequently errors occur. MA interviews determined where the gap in communication occurs during the patient intake process. A MA communication and MiChart survey was used to quantify the suggestions made in the interviews. The random beeper test quantified the percentage of MA value-added and non-value added work time. The results from the patient intake time study and patient arrival data were
used to create a simulation of the current process. The current state simulation was then compared to the recommended, alternative intake processes.

**Complete Literature Search**
Before initial client and coordinator meetings, the team completed a literature search on MiChart implementation at University of Michigan Health System (UMHS). *UMHS Headlines* provided background on the MiChart launch in August 2012 that led to a new intake process. The team also researched how MiChart training was provided to employees before implementation of MiChart to grasp the system for the project.

**Conduct Interviews**
Between February 8 and February 15, the team interviewed four intake and four rooming MAs to understand the communication gap better. Six of the eight MAs interviewed work primarily in the Cardiology area of the clinic. Two team members completed three MA interviews and one team member completed two MA interviews.

In addition, the team interviewed four providers in Cardiology between February 11 and February 19 to gather information regarding “first-time quality” issues that are the most significant to providing the best patient care. One team member interviewed two physicians, another member interviewed one other physician and the last member interviewed a group of three nurse practitioners. The list of interview questions is in Appendix C.

**Distribute Surveys**
Between April 11 and April 12, the team distributed 10 Communication & MiChart surveys to both intake and rooming MAs. Seven surveys were anonymously completed. The survey questions were developed from the suggestions made about team communication and the MiChart interface during initial MA interviews. The survey served two primary purposes: to acquaint the MAs with the most common suggestions and features made during the initial interviews, and to quantify the MAs’ reception to the suggestions and features. The Communication & MiChart Medical Assistant survey can be found in Appendix D.

**Perform Time Studies**
Between February 25 and March 15, the team completed 30 times studies of the intake process using a stopwatch to obtain times for intake activities. Each team member completed time studies for 10 patients. The focus of the time studies was Cardiology patients, though some Cardiac Surgery patients were also observed; 25 Cardiology patients and 5 Cardiac Surgery patients were observed. The document used to record the time study by the team can be found below. The team developed this form based on the flow chart of the patient intake process in Appendix A. Before starting the time study, the team completed a mock time study to ensure accuracy between measurers. The segments of time recorded are illustrated in Table 2.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Team</th>
<th>Time (HR:MIN)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient greeted</td>
<td>Intake</td>
<td></td>
<td>Start time: MA first speaks to patient</td>
</tr>
</tbody>
</table>
| Reviewing Meds                 | Intake     | ___ min ___ sec | Start time: Begin med discussion  
End time: End med discussion |
| Patient waits for room         | Intake     |               | Start time: Patient steps out of bay                                 |
| Patient taken to room          | Either     |               | Start time: Patient steps into room                                  |
| Pre-exam procedure             | Rooming    | ___ min ___ sec | Start time: MA enters with immunizations  
EKG  
End time: MA leaves room       |
| Enter patient health history into MiChart | Rooming | ___ min ___ sec | Start time: Open patient chart  
End time: Close patient chart |
| Patient folder delivered to provider | Rooming |               | End time: Folder placed in tray at pod or provider in team room     |

During the time studies three additional items were noted:
- Patient type (new or returning)
- Patient need (EKG, immunization or other)
- Clinic area (Cardiology, vascular surgery or cardiac surgery)

Although the provider’s time with the patient is not a part of the intake process, it is a key time segment in the patient’s time at the clinic. The time a provider spends with a patient is highly dependent upon whether the patient is new or returning. To find a distribution that fits this patient provider time, the team gathered 12 providers’ scheduled times with patients depending on whether they are new or returning. These patient provider times were given to the team in a table from the Lead MA.

**Gather Patient Arrivals**

In order to accurately simulate patients’ arrivals to the clinic throughout the day, the team gathered patient arrival times. Since a patient’s arrival time to the clinic is not included in the time study, the team gathered patient arrival times from the project coordinator. This historical data was given to the team by the project coordinator in the form of an Excel spreadsheet. The Excel spreadsheet includes the appointment time, check-in time, department in the clinic and other information for a two weeks period.
Implement “First-Time Quality” Testing
“First-time quality” refers to the degree of accuracy and completeness of a patient’s chart after the intake process is finished. “First-time quality” is important in Cardiology because patients are treated primarily through medications that are documented in their chart. The team confirmed the participation of nine Cardiology providers, who collectively completed the “first-time quality” tests between March 1 and March 28 to document when and which “first-time quality” errors occur. For each patient, the providers filled out a “first-time quality” review card, which was created by the team based on the errors that providers thought were most significant to providing the best quality care to patients. The card included the patient’s sticker, information on what type of “first-time quality” error occurred in the patient’s chart, and details about the error. The patient’s sticker illustrated the date of their appointment and provider, along with other information about the patient’s clinic visit. The MAs attached these cards to a patients’ health history form if the patient’s Cardiology provider was participating in the test. Upon completion of the card, providers placed it in a box on the desk of Pod C1. Over four weeks of data collection, providers completed 33 cards. The “first-time quality” review card is illustrated in Figure 1.

![Figure 1: “First-Time Quality” Review Card](image)

**Conduct Random Beeper Test**
To quantify MA non-value added time and MA value-added work time in the current state, the team conducted a random beeper test. The team conducted a random beeper test with the MAs between February 27 and March 15. All six of the beepers were distributed randomly each day in
Cardiology so that three intake MAs and three rooming MAs carried beepers. The beeper interval was set at four buzzes per hour on average. When the beeper buzzes, the MA recorded his or her current activity on the ticker sheet by tallying “With patient, EKG or Imm,” “Other Clinical Activities” or “Break” for the current time of day. “With patient, EKG or Imm” is a proxy for value added time and “Other Clinical Activities” is a proxy for non-value added time. The categories of the ticker sheet were chosen based on discussions with the quality manager to ensure clear, complete and accurate responses from the MAs. Figure 2 shows the ticker sheet used in the random beeper test.

![Figure 2: Ticker Sheet](TickerSheet.png)

The lead MA coordinated the daily duties of this self-collection study, such as distributing the beepers, collecting the beepers and collecting the ticker sheets. The team collected the ticker sheets from the lead MA upon completion of the test.

Create Simulation of Current State and Alternative Scenarios

To compare the current intake process to alternative processes, the team created simulations of both the current intake process and two alternative scenarios in ProModel for Cardiology and Cardiac Surgery. Three output metrics were primarily considered: total time in the clinic, time spent waiting for a room, and MA utilization. Total time in the clinic refers to the entire clinic visit, which is the total time from when the patient arrives at check-in to when the patient exits check-out. Time spent waiting for a room refers to the patient idle time within the intake process. MA utilization refers to the percentage of time MA resources are with a patient within the ProModel simulation.

The purpose of the alternative scenarios simulation is to provide a digital environment to trial alternative intake processes, eliminating the need for a pilot at the clinic. The team simulated two alternative intake processes at the clinic: “one-team” and “two-team with no assigned exam
rooms”. The “one-team” scenario simulated the intake process before MiChart was launched. Each MA is assigned to a provider and only one MA sees each patient. The “two-team with no assigned exam rooms” scenario simulates the current intake process, however providers are not assigned to specific exam rooms. Therefore, a patient utilizes the first available exam room instead of utilizing the first available exam room for their specific provider.

DATA ANALYSIS & FINDINGS

After completing the interviews, surveys, time studies, patient arrival cycles, “first-time quality” testing, and random beeper testing, the team analyzed the data collected and created a simulation of the intake process using metrics from the analysis results.

Evaluating Interviews
The team evaluated both the provider and MA interviews by identifying common responses.

Provider Interviews
To evaluate the four provider interviews, the team created a list of common issues resulting from data entry experienced by the providers. The errors indicated as most significant by the providers during the interviews were placed on the “first-time quality” review card. 100% of the providers interviewed responded that properly documented medications were significant to providing quality patient care. 50% of the providers identified smoking as a common error in a patient’s chart. According to the nurse manager, the EKG diagnosis error identified by a provider is not the responsibility of MAs; therefore, this error was excluded from the review. The remaining errors in the list below were responses mentioned by one of the providers.

Significant “First-Time Quality” Errors Noted by Providers:
- Medication Dosage
- Medication Frequency of Consumption
- Medication Type
- Smoking
- Vital Signs
- Immunizations

Interviews with the providers revealed that errors concerning medications were the most significant to providing the best patient care and were perceived to occur frequently at the clinic.

MA Interviews
To evaluate the eight MA interviews, responses were cross-referenced for common themes to determine where gaps in communication and MiChart issues with the current state occur. The following provides a list of common responses by MAs during the interviews.

Comments on Current State:
- MA teams do not sufficiently communicate the needs of upcoming patients to each other.
- MAs often need more help to perform miscellaneous duties.
- Inconsistencies occur in habits and processes between pods and providers in the clinic.
Comments on MiChart:
- MiChart is not accessible by two viewers at once.
- MiChart is easy and simple for returning visitors, but difficult and tedious for new patients.
- MiChart should include more areas to type in miscellaneous notes about patients.
- Information such as vital signs should transfer automatically from intake equipment to MiChart.

Interviews with the MAs revealed that there are both communication issues and accountability issues at the clinic, as well as improvements possible in MiChart.

Assessing Survey Results
The survey results were assessed in order to quantify the MAs’ responses and suggestions from the MA interviews. For clinic communication, 86% find mass MA pages useful to ask for help between pods and 71% responded that the group chat is helpful to relay information regarding a specific patient’s needs. Two MAs stressed that the group chat is helpful to relay this information only if everyone frequently checks the chat for new messages. 67% states that having a board summarizing daily metrics for a pod would not be useful because they already have the printed schedule. The team thinks that this question should have been more detailed, because a board would provide much more information than a schedule. For information provided by management, the MAs would like to know which areas of the clinic are busiest during the day and whether MAs are sent home early. For MiChart updates, 57% of the MAs stated that a patient note section in MiChart to document a specific patients needs for a visit would be the most important update. 43% ranked the highlighting a patient’s name if another user is viewing the patient’s chart as a critical MiChart update. 6 of the 7 MAs claimed that displaying the number of patients for each dot color on the schedule screen is not an important feature to have in MiChart.

Determining Distributions from Time Studies
To calculate the intake and rooming distributions, the time study results were entered into Excel for calculations and then inputted into ProModel’s program Stat::Fit for distribution analysis.

Time Study Results in Excel
After collecting time study data for 30 patients at the clinic, the team entered the raw data into an Excel spreadsheet and subtracted discrete event times to determine the following activity times: intake, wait and rooming. The times for reviewing medications, pre-exam procedures and entering patient health history were also included in the Excel spreadsheet. Table 3 below provides the spreadsheet fields that required calculation from the raw data.
Table 3. Time Study Spreadsheet Calculations

<table>
<thead>
<tr>
<th>Activity</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
<td>Time “patient is greeted” to time “patient begins waiting”</td>
</tr>
<tr>
<td>Wait</td>
<td>Time “patient begins waiting” to time “patient taken into exam room”</td>
</tr>
<tr>
<td>Rooming</td>
<td>Time “patient taken into exam room” to time “patient folder delivered to provider”</td>
</tr>
</tbody>
</table>

Table 4 summarizes the time study findings for the total intake process and each individual activity. The average total intake process time for the 30 observed patients is 30 minutes. The most time consuming activity of the intake process is waiting to be roomed with an average of 12 minutes. However, the wait time is extremely variable with a standard deviation of 16 minutes. The second most time consuming activity is intake with an average of 9 minutes and a standard deviation of 5 minutes.

Table 4. Time Study Findings

<table>
<thead>
<tr>
<th>Activity</th>
<th>Average Time (Min)</th>
<th>Standard Deviation (Min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Intake Process Time</td>
<td>30</td>
<td>17</td>
</tr>
<tr>
<td>Intake</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Wait</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Rooming</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Review Medications</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Pre-exam Procedures</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Enter Patient Health History</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition to the activity findings, the team observed 17% new patients and 83% returning patients. Only 3% patients required immunizations and 70% patients required EKGs. 20% of the patients’ health histories were entered into MiChart during the intake process. These percentages were used in the current state simulation to ensure accurate modeling of the patient population.

Time Study Results in Stat::Fit

The team used Stat::Fit’s Auto::Fit to determine the proper statistical distributions for intake and rooming. Statistical distributions for the rooming activity differ depending on the patient’s EKG and immunization needs. The distributions that rank the highest in Stat::Fit and are distributions in ProModel are used in the simulation. Figures 3 to 5 show the histograms for intake, rooming without EKG or immunization, and rooming with EKG.
**Figure 3:** The Intake Time Distribution – Pearson 5

The Pearson 5 distribution fits the 30 patients intake activity with 97.5% fit.

**Figure 4:** The Rooming Time without EKG Distribution – Pearson 6

The Pearson 6 distribution fits the 8 patients rooming without EKG activity with 93.1% fit.
Figure 5: The Rooming Time with EKG Distribution – Pearson 5

The Pearson 5 distribution fits the 22 patients rooming with EKG activity with 56.3% fit. This percentage is low, but it is the highest fit available and implementable in ProModel. These statistical distributions were used to simulate the current state to ensure the best possible accuracy for the patient and MA processing time.

Provider Time with Patient in Stat::Fit
In addition to determining the time distributions for each activity, the time a patient is with a provider was statistically analyzed to assign a distribution given a new or returning patient. The time a patient spends with a provider is outside the scope of this project, but necessary in order to simulate the intake process. The team analyzed appointment times for 10 provider’s new and returning patients. Figures 6 to 7 show the histograms for new patient provider time and returning patient provider time with the distribution.
Figure 6: New Patients Time With Provider Distribution – Triangular

The Triangular distribution fits the 10 provider’s new patient time with 100% fit.

Figure 7: Returning Patients Time With Provider Distribution – Uniform

The Uniform distribution fits the 10 provider’s returning patient time with 24.4% fit. This percentage is low, but it is the highest fit available and implementable in ProModel. These statistical distributions were used to simulate the current state to ensure the best possible accuracy for the patient with provider time.

Calculating Patient Arrival Cycles in Excel

To simulate patient arrivals from 7AM to 5PM, patients arrivals were analyzed in Excel from Monday through Friday over two weeks. The number of patients arriving each hour for the ten
days was averaged for all ten hours of the day. On average, 184 patients arrive each day. Table 5 shows the number of patient arrivals for all ten hours of the day.

Table 5. Patient Arrival by Hour of Day Over All Days of the Week

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Number of Patient Arrivals</th>
</tr>
</thead>
<tbody>
<tr>
<td>7AM - 8AM</td>
<td>4</td>
</tr>
<tr>
<td>8AM - 9AM</td>
<td>16</td>
</tr>
<tr>
<td>9AM - 10AM</td>
<td>28</td>
</tr>
<tr>
<td>10AM - 11AM</td>
<td>28</td>
</tr>
<tr>
<td>11AM - 12PM</td>
<td>20</td>
</tr>
<tr>
<td>12PM - 1PM</td>
<td>18</td>
</tr>
<tr>
<td>1PM - 2PM</td>
<td>28</td>
</tr>
<tr>
<td>2PM - 3PM</td>
<td>20</td>
</tr>
<tr>
<td>3PM - 4PM</td>
<td>17</td>
</tr>
<tr>
<td>4PM - 5PM</td>
<td>5</td>
</tr>
</tbody>
</table>

Patients arrive the most from 9AM-11AM and 1PM-2PM. These findings are used to model patient arrivals by time of day to the clinic in the simulation.

Performing Root Cause Analysis on “First-Time Quality” Testing

The team originally planned on entering the errors recorded from the “first-time quality” review cards into Minitab to perform a root cause analysis. The study was extended by a week to increase participation. However, after the week extension there was still limited participation in the study. From the 33 review cards submitted, only one error was recorded. Therefore, no root cause analysis was performed in Minitab.

To have confidence that the “first-time quality” test was an accurate representation of the clinic’s quality level, it was essential to have a sufficient sample size of “first-time quality” review cards. To determine what exactly qualified as a sufficient sample size, the team determined the statistical sample size requirement that would achieve a 95% confidence level. The sample size required can be determined using Equation 1. Using this equation, 47 review cards would be necessary to conclude with 95% confidence that the “first-time quality” results are an accurate representation of the clinic with 5% margin of error. However, in reality only 33 review cards were collected, so the team determined the margin of error for a sample size of 33 cards. The margin of error for the sample size of 33 review cards is 6% at 95% confidence level. This means that statistically, the team can say with 95% confidence that that the “first-time quality” test results are representative of the average at the clinic with a 6% margin of error.
Equation 1: Sample Size

\[ n = \left( \frac{z\sigma}{E} \right)^2 \]

Quantifying MA Time With Patient from Random Beeper Test

The team entered the raw data results from the 54 ticker sheets into an Excel spreadsheet. Ticker sheets were collected from 27 rooming MAs and 27 intake MAs. Ticker sheet tallies were separated by time of day: 7am-11am, 11am-2pm, 2pm-5:30pm and by activity: with patient, without patient and break. 1380 tallies were recorded among the ticker sheets collected from the MAs.

The team found that in the current state at the clinic, the MAs’ percentage of time spent with the patient is virtually identical to the MAs’ percentage of time spent without the patient when averaged throughout the entire workday, 48% and 47% respectively. MAs spend 5% of their time on break. The pie chart in Figure 8 illustrates the total percentage of time an MA spends with the patient, without the patient, and on break averaged throughout the day and week.

![Average Total MA Activity](image)

**Figure 8:** Average Total MA Activity

**With Patient:** refers to intake bay activities, rooming process, EKGs and immunizations
**Without Patient:** refers to all other clinical activities
**Break:** refers to off-duty break time

However, the team found that the MAs’ percentage of time spent with the patient varies significantly throughout the workday. Figure 9 illustrates the percentage of with patient and without patient time by time of day. MAs spend the most time with patients from 11:00 AM - 2:00 PM. MAs spend the least time with patients from 2:00 PM - 5:30 PM.
To further analyze MA activity during the week, the team evaluated MAs’ percentage of time spent with patient by time of day and day of the week. Figure 10 utilizes conditional formatting to illustrate using a color gradient the percentage of time an MA spends with the patient by time of day and day of the week. The green boxes show high percentages of time spent with the patient and the red boxes show low percentages of time spent with the patient. Tuesday and Wednesday midday the MA spends the most time with the patient, 70% and 63% respectively. Thursday and Friday afternoons the MAs spend the least time with the patient, 29% and 31% respectively.

<table>
<thead>
<tr>
<th>MAs’ Percentage of Time Spent with Patient</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 - 11am</td>
<td>56%</td>
<td>45%</td>
<td>42%</td>
<td>49%</td>
<td>50%</td>
</tr>
<tr>
<td>11 - 2pm</td>
<td>55%</td>
<td>70%</td>
<td>63%</td>
<td>37%</td>
<td>35%</td>
</tr>
<tr>
<td>2 - 5pm</td>
<td>47%</td>
<td>57%</td>
<td>63%</td>
<td>29%</td>
<td>31%</td>
</tr>
</tbody>
</table>

**Figure 10:** MAs’ Percentage of Time Spent With Patients by Time of Week

**Simulating the Current Intake Process and Two Alternative Scenarios**

Upon completion of the time study, beeper test and patient arrival cycle analysis, the team simulated the Cardiology and Cardiac Surgery areas of the clinic following a few assumptions. Both the Cardiology and Cardiac Surgery areas were simulated because they share the same six intake bays. Since a patient’s time waiting for a room is dependent on the time a provider spends with a patient, the entire process for a patient in the clinic was simulated. The general process for the simulation is as follows:

- Check-in
- Intaking
- Waiting for exam room
Intaking, waiting for exam room and rooming are the intake process. Check-in, patient time with provider and check-out are out of scope, but included for simulation purposes. With the current state simulation and the simulation assumptions, the team simulated the “one-team” and “two-team with no assigned exam rooms” in ProModel. The three output metrics, total time in the clinic, time spent waiting for a room, and MA utilization, were compared for all three simulations.

Simulation Assumptions
The team made a few key assumptions in ProModel to simulate the three intake processes:

- The same number of patients enter Cardiology and Cardiac Surgery areas each day of the week
- Patients arrive at the beginning of the hour if their appointment is within the hour
- Patients whose check-in times were left blank in the patient arrival report always arrive and check-in at their exact appointment time
- MAs’ shifts, 6 intake MAs and 6 rooming MAs are the same Monday through Friday
- 13 providers work Monday through Friday
- Each provider has two exam rooms
- 26 exam rooms and 6 intake bays are utilized Monday through Friday
- If MAs are not with a patient, they are available
- Patients spend two minutes at check-in and check-out
- Providers time with patient and patient arrival cycle for two weeks accurately represent clinic conditions

Current State
The current state simulation models reception C, pod C1, pod C2 and all related bays and rooms for Cardiology and Cardiac Surgery. The 6 intake bays and 26 exam rooms are determined from the rooms assigned to Cardiology and Cardiac Surgery. The six intake MAs, six rooming MAs and 13 providers are determined based on staffing schedules for Cardiology and Cardiac Surgery. The four EKG machines are the average used in Cardiology and Cardiac Surgery, as estimated by the MAs. The distance between the intake bay, waiting area and exam room were measured and used in the MAs networking. The intake MAs and rooming MAs are assigned shifts to closely match the MA schedules each week.

184 patients arrive to the clinic each day. The patients arrive each hour following the patient arrival cycle analysis. Upon arrival to check-in at reception C, each patient is labeled as new or returning, EKG or no EKG, immunization or no immunization and provider 1 through 13. These patient assignments are based on time study results and providers rooming assignments. The patient then waits in the intake queue to be taken to an intake bay by an intake MA. The patient is in the bay with the intake MA for a given intaking time based on the intake time distribution. The patient then proceeds to the rooming queue and waits to be taken by a rooming MA to an exam room assigned to the patient’s specific provider. In the exam room, the patient waits
according to the rooming time distribution with the rooming MA. This rooming time is determined by the distribution for rooming time based on whether the patient needs an immunization, EKG or neither. The patient waits in the room for the provider. The patient is seen by the provider for the patient with provider distribution time defined by whether the patient is new or returning. Once the patient provider time is complete, the patient checks out and then exits the clinic.

“One-Team”
The “one-team” simulation has 13 MAs assigned to the 13 providers. An additional MA is utilized for simplicity with the 13 providers and 26 exam rooms. Upon check-in, a patient is assigned an MA and a provider. After check-in, the patient waits in the intake queue for their specific MA and then proceeds to the intake bay with the MA when the MA is available. The remaining simulation process is the same as the current state, except the patient is only serviced by their MA in rooming as well. The network for the “one-team” MAs differs from the current process since the MA completes both intake and rooming.

“Two-Team with No Assigned Exam Rooms”
The “two-team with no assigned exam rooms” simulation is the same as the current state simulation except that when patients wait for an exam room, they proceed to the first available exam room regardless of their provider. Patients wait for an exam room following first-in-first-out queuing.

Output Metrics for Three Simulations
The total time in the clinic, time spent waiting for a room, and MA utilization for the current state, “one-team” and “two-team with no assigned exam rooms” were the focus of the simulation output. The total time in the clinic illustrates the time the patient spends in the CVC clinic on average. However, this time is not the sole focus of the project. The intake process time is influenced by the intaking activity, wait for a room activity and rooming activity. Since the intaking activity and the rooming activity are set by the distributions developed from the time study, the time waiting for a room is the only activity within the intake process affected by the different scenarios. Lastly, the intake MA and rooming MA utilization from the simulations can be compared to the beeper test findings for percentage of “with patient” time, since a patient is only utilized when with a patient in the simulation. Table 11 shows three average output metrics for the three simulations.

Table 6: Average Output Metrics for Three Simulations

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Total Time in Clinic (min)</th>
<th>Time Waiting for Room (min)</th>
<th>Intake MA Utilization</th>
<th>Rooming MA Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current State</td>
<td>97</td>
<td>33</td>
<td>26%</td>
<td>32%</td>
</tr>
<tr>
<td>One-Team</td>
<td>105</td>
<td>33</td>
<td>26%</td>
<td>30%</td>
</tr>
<tr>
<td>Two-Team with No Assigned Exam Rooms</td>
<td>95</td>
<td>16</td>
<td>28%</td>
<td>26%</td>
</tr>
</tbody>
</table>
The “one-team” simulation has the largest total time that the patient is in the clinic with an average time of 105 minutes or 1 hour and 45 minutes. The “two-team with no assigned exam rooms” simulation has the shortest total time that the patient is in an exam room with an average of 95 minutes or 1 hour and a half. The current state simulation has a very similar result with an average of 97 minutes. The time waiting for a room for the current state and “one-team” simulations is the same with an average of 33 minutes. However, for the “two-team with no assigned exam rooms” simulation the time waiting for an exam room is only 16 minutes. The MA utilization for all three simulations is between 26% and 32%. This is about 10% less than the beeper test results for MA time with patient.

CONCLUSIONS & RECOMMENDATIONS

Based on the findings and analysis the team determined the following conclusions and recommendations for the CVC clinic management. The conclusions and recommendations align with the project objectives. The objective of the quality recommendations is to improve “first-time quality” and meet meaningful use requirements. The objective of the team communication and MiChart updates is to improve team communication. The objective of the MA time allocation recommendations is to minimize MA downtime. Lastly, the objective of the alternative intake process is to reduce intake process time and MA downtime, and increase patient and employee satisfaction.

Quality
After collecting the “first-time quality” review cards and interviewing providers in the clinic, the team has concluded that the perceived number of errors is higher than the actual number of errors. “First-time quality” errors make a large impact on the quality of a patient’s care. Although the number of “first-time quality” errors is less than perceived, the errors are still significant and need to be addressed. The team recommends that the clinic continues to document and record when “first-time quality” errors occur in the intake process. Providers would document the errors on the “first-time quality” review card and return the completed “first-time quality” review cards to the Lead MA or Nursing Supervisor. The Nursing Supervisor would record the errors in a Qualtrix survey. The Qualtrix survey would become a database of recorded “first-time quality” errors in the clinic. At the MA staff meeting each month, the recorded “first-time quality” errors would be reviewed and countermeasures would be provided to prevent the error from occurring again.

Team Communication
Following analysis of the MA interviews and Communication and MiChart survey results, the team has concluded that there are several inefficiencies in the methods of communication in the clinic. In terms of communication between teams, the MAs do not know the most efficient way to communicate when their pod needs help. In addition, they want a means to communicate patient needs to the other MA team and to providers. To improve the MA team communication in the clinic the team has developed two recommendations: a daily metrics board and daily lean pod huddles.
Daily Metrics Board
The team recommends that the clinic develop daily metrics boards for each pod. The board would contain information pertaining to daily provider schedules, daily MA work schedules, monthly “first-time quality” progress, weekly discussion points, and weekly patient volumes. Figure 11 illustrates what the board would look like.

Figure 11: Daily Metrics Board Mock-Up

The section of the board for discussion points is an area for staff to document any issues that they wish to discuss or areas they see for improvement. The team recommends that the lead MA take responsibility for monitoring and updating the daily metrics board. Daily, the lead MA would update and choose a “float MA” (see Alternate Process) and add the provider schedules. Weekly, the lead MA would update the “first-time quality” error graph and the total patient volumes. The daily metrics board would allow staff to get an overall understanding of the current state of the clinic, which areas are busiest, who is working, and who is available to help.

Lean Huddles
The team recommends that the clinic also implement daily lean huddles facilitated by the lead MA. These lean huddles would take place each day around noon. This time was selected based on the success of the lean huddles in other areas in the University of Michigan Health System. The team estimates that each huddle would last about five minutes. The daily metrics board would be a guide for these huddles, as each pod would discuss the number of patients in each pod that day, the “float MA” assignment, recent “first-time quality” errors and any recent discussion points.
MiChart Updates
The team has also concluded that MiChart causes delays in the clinic. Currently, the MAs must order each EKG individually, instead of being able to batch order the EKGs for a provider’s patients. They are unable to identify when another user is viewing a patient’s chart, and they cannot document notes regarding a patient’s needs. The team recommends that the clinic management work with Epic to make changes to MiChart to better fit the clinic’s processes. The team recommends that the following changes are implemented:
- Create batch ordering for EKGs by provider
- Highlight a patient’s name when their chart is being viewed by another user
- Add a patient note section on the schedule screen

MA Time Allocation
Analysis of the random beeper test revealed that MA time allocation at the clinic is uneven by both the time of the day and the day of the week. The team concluded that Tuesdays and Wednesdays from 11:00am – 2:00pm are the busiest times of the week for MAs, while Thursdays and Fridays from 2:00pm – 5:00pm are the slowest times of the week for MAs. While changes to the staffing model are out of scope for the team, it was difficult to overlook the stark contrast in the MA activity level throughout the week. MAs essentially double the workload during Tuesday and Wednesday midday compared to Thursday and Friday afternoons. Because of this, the team recommends that the clinic investigate shifting some staff from Thursday and Friday afternoons to Tuesday and Wednesday midday. Shifting the staff is expected to minimize overall MA downtime and ease the strain of the MA workload on Tuesday and Wednesday midday, while still providing an adequate level of service to patients in the Cardiology area on Thursday and Friday afternoons.

Alternative Process
In completion of the simulation and the analysis of the output, the team was able to recommend an alternative intake process for the Cardiology area of the clinic that would increase staff satisfaction and team communication. From the findings, it is evident that returning to the one-team intake process would increase overall intake time and MA downtime. However, it would increase patient and staff satisfaction by adding a more personal experience. The one-team system also improves accountability between the providers and MAs, since one MA is assigned to a provider and patient. The team believes that an alternative process exists that can both reduce overall intake time and MA downtime, as well as increase staff satisfaction and accountability. Thus, the team does not recommend returning to the one-team intake process that was in use before MiChart. Instead, the team recommends continuing to use the two-team intake process with a few alterations to improve communication between the teams.

To improve staff communication, staff satisfaction and accountability, the team recommends that the clinic implement the current intake process with an additional MA role titled “float MA”. The “float MA” would be assigned by the lead MA each day and the assignment would be indicated on the daily metrics board in the “MA Schedule” section. The “float MA” is responsible for responding to mass MA pages by “floating” to the pod in need. When a pod sends out a mass MA page indicating the pod that requires help, the “float MA” is accountable for responding to the mass MA page. As indicated in the MA surveys, mass MA pages are very useful. However, the MAs do not know if a mass MA page has been responded to and by whom.
In order for the “float MA” to be effective, he or she must be cross-trained in all pods and on all teams in the clinic. The team expects that the two-team “float” MA intake process will improve communication between teams, assist pods with large patient volume, add accountability to mass MA pages and integrate the daily metrics board into “float MA” staffing assignments.
ABOUT THE TEAM

Meghan Crist is a senior in Industrial and Operations Engineering at the University of Michigan graduating in May 2013. While at Michigan, she has been involved in Young Life College and Relay for Life, in addition to minoring in Chemistry and International Engineering. This summer, Meghan will start her position at Eli Lilly as an Industrial Engineer. (cristme@umich.edu)

Robin Harn is a senior in Industrial and Operations Engineering at the University of Michigan receiving his BSE in May 2013. On campus, he directs the UM Smash student organization and is a Peer Advisor for the College of Engineering. He plans to pursue a master’s degree at UMSI after graduation with a specialization in human computer interaction. (robharn@umich.edu)

Alison Horn is a senior in Industrial and Operations Engineering at the University of Michigan graduating in May 2013. On campus, she has been involved in her sorority, Pi Beta Phi, as past president and current Greek Week Chair. This summer Alison will start her position at Epic as a Technical Services Specialist. (achorn@umich.edu)
Appendix B: Floor Map
Appendix C: Interview Questions

MA Interview Questions

1. Primarily, what team do you work on in the CVC, intake or rooming?
2. Primarily, do you work in vascular surgery, cardiac surgery or cardiology?
3. How long have you been working in the CVC?
4. Have you ever worked in another clinic or department?
5. Where do you think the lapses are in communication between the teams?
6. What is the most frustrating part of your job?
7. What are the strengths and weaknesses of the current process from your perspective?
8. Would you please walk us through your work routine from when you see the patient until you are finished with the patient?
9. What do you wish MiChart could do for you?
10. What questions do you still have about MiChart?
11. What do you do with your downtime?
12. What do you review of a patient’s MiChart before seeing them?
13. How do you approach best practice alerts in MiChart?
14. What could be done in intake/rooming to make your job easier?

Provider Interview Questions

1. How long have you been working in the CVC?
2. What do you review in a patient’s chart?
3. How often do you see mistakes in a patient’s chart?
4. Where do you commonly see errors in MiChart? (Immunizations, meds, tobacco use, etc.)
5. What do you do when you notice errors in a patient’s health history?
6. When reviewing a patient’s medications, what do you check? (Dosage, frequency, etc.)
7. What do you qualify as an error in a patient’s health history?
8. What could be done by the intake and/or rooming team to improve “first-time quality?”
Appendix D: Communication and MiChart Survey

### Communication and MiChart Medical Assistant Survey

<table>
<thead>
<tr>
<th>Communication Updates</th>
<th>Yes</th>
<th>Neutral</th>
<th>No</th>
<th>If no, please specify what would be?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are mass MA pages useful to ask for help?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is the group chat helpful to relay information regarding a specific patient’s needs?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Is the group chat helpful to notify others that the rooming or intake team is behind schedule?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Would a pod huddle each day to discuss issues in the clinic be helpful?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Would it be helpful to know which MAs are assigned to intake and room a patient?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Would having a board for each pod summarizing daily metrics (schedule, total patients, etc.) be helpful?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What information from management would be helpful to know each day?

What information from providers would be helpful to know each day?

When do you document a patient’s health history in MiChart? (Please choose one answer.)

- [ ] During intake
- [ ] During Rooming
- [ ] After seeing the patient

### MiChart Updates

Please rank the potential MiChart additions in order of importance. 1 being the MOST important and 5 being the LEAST important.

<table>
<thead>
<tr>
<th>1. Patient note section to document specific patient needs for a visit</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Batch order EKGs for a provider</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Highlight a patient’s name if another user is viewing chart</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Display number of patients for each dot color on schedule screen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please provide any additional suggestions regarding communications and MiChart updates on back.

Comm MiChart Survey
Appendix E: Bibliography