University of Michigan Health System

Program and Operations Analysis

Analysis of the Rehabilitation Unit’s Admissions Process

Final Report

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Executive Summary

Patients admitted to the Adult Rehabilitation Unit (UH-6A) at the University of Michigan Hospital (UMH) usually arrive at the unit between late afternoon and evening. Although most patients are medically approved to move to UH-6A early in the day, they do not arrive to UH-6A until many hours later. There are many delays in the process of admitting patients to UH-6A, and it is perceived that reducing or eliminating some of those delays will decrease the length of time between when a patient is medically approved to move to UH-6A and when he or she actually arrives to the unit.

The goal of this project was to decrease the length of the admission process in order to increase patient throughput, increase availability of beds in acute care units and to decrease lost revenue to the hospital.

UH-6A is the only unit in UMH that operates as a separate entity, so patients cannot simply be transferred, but must be discharged from the sending unit and admitted into UH-6A. The frequency of these late arrivals creates challenges for UH-6A, the sending unit, and the greater University Hospital System, such as:

- Predicting arrival time is difficult and creates staffing challenges for UH-6A
- Patients waiting to be moved to UH-6A occupy beds in sending units that would be better used by patients in need of acute care
- Insurance does not cover the day of discharge and covers the day of admission only if the patient receives 3 hours of physical, occupational, and speech therapy on that day. Patients almost always arrive long after therapy is available. Therefore UMH loses revenue for an entire day of care for nearly every patient admitted into UH-6A.

During our analysis we used a number of data sources to develop our final recommendations. We conducted interviews with key personnel involved with the admission process. We obtained and analyzed patient admission data from the UH-6A unit clerk throughout the process. We obtained and analyzed historical data for patients admitted to UH-6A from January 2005 to January 2006, with a sample size of 529 patients. We performed a two week patient tracking study from March 13 to March 24, 2006 which included all patients admitted to UH-6A from other units in the hospital. This data provided detailed information about current delays and has a sample size of 20 patients.

Analysis of the admissions process revealed the major sources of delays, most notable findings include:

- **UH-6A delays in admitting a patient:** Admission tasks must be performed before a patient is ready to receive therapy. This process currently takes 3-4 hours
- **Sending Unit delays in discharging a patient:** Discharge tasks are complex and time consuming. Physicians and nurses must complete detailed paperwork before the patient can be discharged from the sending unit.
• Transportation delays: Although a comparably minor delay, patient transport is sometimes delayed due to high transporter workload or transit delays such as elevator unavailability

• Environmental Service delays: Patients cannot be admitted until the bed or room is cleaned, related delays include high workload, poor communication about need for room to be cleaned, and time-consuming room maintenance procedures

• Utilization Review delays: Time consuming efforts to locate patient records and personnel before patient can be discharged from sending unit are common

Based on these findings, we have developed recommendations to reduce or eliminate delays in the admission process. Recommendations include:

• Alter Therapy Session Time: Extend therapy hours to 8:00 pm or alter shift hours so that the patient may receive the therapy needed and UH-6A can receive compensation for the day of admission

• Develop New Procedure for Insurance: Check insurance information for Rehabilitation coverage when patient is first admitted to the hospital. Or change agreement with insurance provider so that they provide compensation for the day of admission if the patient receives three hours of therapy within 24 hours of admission

• Set Departure Time for Existing UH-6A Patients: Patients could move to UH-6A earlier if beds are available earlier in the day. By enforcing a set discharge time UH-6A would have beds free earlier in the day

• Develop Easier Process for Utilization Review: Instead of collecting paperwork from a variety of locations the Utilization Review representative would have easy access to more of this information online

• Reduce Admissions Process Time: Some tasks done upon admission to UH-6A could be completed on the sending unit before a patient is moved. UH-6A physicians and nurses could go to other units within the hospital to complete some admissions tasks instead of waiting for the patient to arrive. This would decrease admit time in UH-6A and may allow patients to receive therapy the day they are admitted

• Allocate More Beds to UH-6A: Adding more beds would decrease occupancy percentage and decrease delays in patient admission related to discharging the current patient from UH-6A

• Improve Communication System: Creating online databases for patient information would decrease time spent looking for written materials

Although many of the delays in the admissions process are uncontrollable, implementing these recommendations will help to shorten the length of the admissions process to UH-6A, decrease lost revenue to UMH, and improve patient care.
Introduction

The Adult Rehabilitation Unit, UH-6A at the University of Michigan Hospital (UMH) provides comprehensive nursing and highly skilled compensatory care to patients who are sometimes clinically fragile and often very dependent. It commonly takes many hours before patients who are medically approved for admittance to UH-6A actually arrives to the unit. The perception of the Clinical Nurse Manager of UH-6A is that this time gap is too long. The Clinical Nurse Manager also believes that patients arrive at the unit too late in the day. She reports that patients frequently arrive as late as 9:00 pm.

Therefore, the Clinical Nurse Manager of UH-6A has asked our team to analyze the admissions process in order to reduce the time gap, to identify the underlying delays, to determine which of those delays may be reduced or removed and to develop recommendations to reduce or remove them.

Our team, the Rehabilitation Project Group has investigated the admissions process from the time the admissions coordinator notifies the unit clerk of UH-6A of a potential admit until the time that patient arrives to UH-6A. We were asked to study the steps in the admissions process, identify sources of delays, and determine why patients are arriving to UH-6A so late in the day.

As part of this analysis, we have identified delays in the process. We have analyzed time data to understand the distribution of times. We have also analyzed the lost revenue associated with the day of admission for the patient. From our conclusions, we have developed recommendations to improve the process by reducing and eliminating delays. These recommendations will also help increase patient throughput in the rehabilitation unit. This report presents our findings and conclusions made regarding the admissions process of UH-6A.

Background

The process of admitting a patient to the Adult Rehabilitation Unit (UH-6A) involves several steps and several people. Unlike other units within the UMH, UH-6A acts as its own operating entity. To transfer a patient to UH-6A, the patient must be discharged and admitted to UH-6A. On average, the unit admits two patients each day, but some days the unit admits six or more patients. A variety of injuries and illnesses are treated in UH-6A, including patients with spinal cord injuries, head injuries, strokes, neuromuscular injuries or diseases, or debilitation from chronic complex medical problems. Patients admitted can arrive from all other units within the hospital and from outside sources. Patients usually arrive to the unit between 1:00 pm and 7:00 pm. Arrivals after approximately 3:00 pm, according to the Clinical Nurse Manager, cause delays not only for UH-6A but for other units within the hospital. The following is a display of how the hospital is affected.
There is a Domino effect between the units within the hospital. If there is a delay getting patients in and out of UH-6A, there will be backups from the acute care units all the way to the patients in the waiting room pending treatment.

There is also an issue regarding cost which is of importance. The patient must receive 3 hours of therapy in order for UH-6A to receive compensation from insurance for the day of admission, which is generally the most expensive day of stay with an average charge of $1636.27 per patient. UH-6A has a collection rate of 58% which means they should be receiving $949.04 per patient admitted on this day. Therapy appointments are available from 8:15 am to 12:00 pm and 12:30 pm to 4:00 pm. The patient must also receive meals at the set time they are served. Breakfast is served at 7:30 am, lunch at 12:00 pm and dinner is served at 5:00 pm.

Prior to arrival, patients are assigned to a bed according to their needs and the unit’s restrictions or availability of beds. UH-6A contains 32 beds, 16 semi-private and 16 private. Four of the private rooms are equipped for the use of ventilators, but the unit only allows 2 ventilator-dependent patients on the unit at a time. Semi-private rooms require both patients occupying the room to be of the same sex.

Patients with high medical needs, isolation precautions, and ventilator dependencies are placed in private rooms. Also, patients having social factors which require them to have family or a care giver present at all times may require placement in a private room. At time patients must be transferred from existing rooms to accommodate new patients.

The inpatient admissions process involves an admissions coordinator, unit clerks of UH-6A, discharging unit clerks and nurses, physicians, and several others. The number of individuals involved in the process and other delays in the process itself result in a large gap between the time the patient is approved for admittance and the time the patient actually arrives to the unit. The problem addressed by this project had been addressed in the past; however, the efforts have not been as successful as hoped and much of the data collected had been lost.

**Primary Parties Involved**

The Program and Operations Analysis team has examined the process of admitting patients to UH-6A. The primary parties involved in this project include nurses, the
admissions coordinator, charge nurses, unit clerks, resident physicians, environmental services staff, therapists, patient transporters, and patients.

Key Issues

The key issues that drove the need for this project included:

- Most patients waiting to be moved to UH-6A are approved between 9:00 am and 11:00 am, but arrive as late as 10:35 pm
- Patients must receive 3 hours of therapy on the day of admission in order for UH-6A to be compensated for that day
- Wide distribution of patient arrival times to UH-6A causes uneven workload for nurses, which may influence patient care and employee satisfaction
- Several variables make the process of assigning patients to beds in UH-6A difficult
- Many delays in the process are perceived to be controllable
- Vast perception that new admits and discharges are delayed until the beginning of the new shift

Project Scope

This project included in detail only the patient admissions process to UH-6A. The process begins when the admissions coordinator notifies the unit clerk of UH-6A of a possible admit and ends when the patient arrives to the unit. Specifically, we studied activities associated with obtaining medical and insurance approval of patients, activities of physicians and nurses in the process of discharging patients, activities of Environmental Services, and the costs associated with the day of admission.

Any task connected to admitting a patient to UH-6A from outside of the hospital was not included in this project. The process of admitting patients to units other than UH-6A was not studied.

Goals and Objectives

To determine why patients arrive to UH-6A long after they have been approved for admittance, the student team has conducted the following tasks:

- Identified the steps required to admit a patient to UH-6A, from the time the admissions coordinator notifies the unit clerk on UH-6A until the patient arrives to the unit, to identify delays in the process
- Identified the steps required to discharge a patient to UH-6A
- Helped UH-6A employees to better understand the admissions process and their role(s) in the process
- Identified persons whose decisions or actions influence the process

With this information, we have developed recommendations to:

- Eliminate or reduce delays in the process
- Increase time available for patient care by reducing admission process time
• Set standards for patient arrival time to UH-6A
• Increase patient throughput
• Reduce lost cost associated with the first day of admission

Approach

To obtain data we have done the following: investigated the admissions process of other rehabilitation units; interviewed key personnel from UH-6A, UH-5A, UH-4A, Environmental Services, Patient Transportation, Utilization Review, Inpatient Admissions; obtained admissions data from the Clinical Nurse Manager and the Admissions Coordinator; tracked patients through the UH-6A admissions process; and we obtained the average costs on the day of admission from the Clinical Information and Decision Support Services. With this data we were able to analyze the steps in the admissions process, identify the delays, and discover how these delays affected patient throughput and hospital charges. Below is a summary of each of the items used to collect data and the information they provided.

Investigated Admissions Process of Other Rehabilitation Units

Our group has completed our literature search to benchmark other leading health care institutions. Performing this literature search enabled us to gather admission process information for other inpatient rehabilitation units to which we could compare to the process of UH-6A. We looked at the processes at St. Joseph Mercy Hospital and the Oakwood Healthcare System. The initial perspective perceived by the Service Delivery Manager at St. Joseph Mercy Hospital is that their process is not very efficient because patients are arriving at around 3:30 pm, which creates delays in their process. Therefore we focused our search on the Oakwood Healthcare System admissions process. Oakwood Healthcare System has two locations, one for the hospital and one for the rehabilitation center. Their patients arrive between the time of 12:00 pm and 4:00 pm. Oakwood has 62.5% capacity. Oakwood Healthcare System offers a late therapy session from 11:00 am to 7:00 pm; therefore, the majority of their patients can meet their necessary therapy requirements.

Interviewed Key Personnel

The group interviewed all persons in UH-6A involved in the admissions process, the Environmental Services Supervisor, the Utilization Management Coordinator, and the Charge Nurse and Unit Clerk for UH-5A and UH-4A. During each of the interviews we obtained the role of the persons in the admissions process as well as their perceived delays.

Obtained and Analyzed Existing Admissions Data

Since the beginning of the project the Clinical Nurse Manager and Admissions Coordinator has provided weekly, patient admissions data. The data provided by the Clinical Nurse Manager included the discharging unit, patient medical condition, date of
admission, insurance approval and UH-6A arrival times for all patients. This data was collected by the Unit Clerk. The data provided by the Admissions Coordinator included the discharge and admit dates, discharging unit, insurance and medical approval times, and the time the patient arrived to UH-6A. This data was collected by the Admissions Coordinator and is dated from January 2002 to March 2006.

We used only the data from January 2005 to January 2006 because the data provided before that time frame did not include the same fields as those currently being provided or needed. Using patient admissions data, dated from January 2005 to January 2006, we constructed an Excel spreadsheet to illustrate the distribution of times associated with insurance and medical approval, arrival time to UH-6A, and the total duration of the admissions process. This data illustrated where the majority of time is being spent in the process and where most of the delays exist (the actual delays). With the patient admissions data, information from our interviews, and findings from tracking patients, we clarified and identified the steps and delays in the admissions process.

We have identified and sequenced the steps in the admissions process and created appropriate flow charts for the process. Flowcharts of the overall admissions process, discharge process, as well as the individual process of the admissions coordinator can be found in Appendix A. The flow charts were approved by both our client and coordinator.

Tracked Patients through the UH-6A Admissions Process

To distinguish perceptions from facts of the process, we have tracked patients through the admissions process for UH-6A. All of the potential UH-6A admission patients were tracked from the notification of their potential admittance until the patient physically arrived to UH-6A. Twenty patients were tracked on the weekdays for a two week period from March 13, 2006 until March 24, 2006. We collected UH-6A notification time of the patient as a possible admit, medical approval time, insurance approval time, the unit from which the patient was being discharged, the patient’s discharge time, and the patient’s arrival time to UH-6A. Data were collected before the end of the first shift between 2:00 pm and 2:30 pm as well as during the second shift starting at 7:00 pm with the final data being collected once the patient had actually arrived to UH-6A. The data collection tool can be found in Appendix A.

Analyzed Cost Data

To determine the compensation lost by UH-6A from the day of admission when therapy is not received, we have looked at the daily rate of therapy and the percentage collection of the hospital for this unit, which was provided by the Clinical Information and Decision Support Services (CIDSS).

Findings and Conclusions

Upon completion of our project we were able to make conclusions based on the information provided to us and the data we analyzed. After completing the data
collection we identified perceived delays, analyzed arrival times, prepared and analyzed discharge and admission time distributions, analyzed data from our patient tracking, as well as analyzed cost data. The following findings and conclusions present what we discovered while performing the previously mentioned approach and the conclusions made thereafter.

*Interviews Reveal Perceived Delays*

Through interviewing, we have identified several perceived delays in the admissions process. The following delays have been grouped by specific parties involved in the admissions process:

**UH-6A Unit Delays in Admitting a Patient**
- Lack of bed availability
- Nurses occupied with other patients or personal needs and unaware of other admits
  - Nurses in UH-6A have little time to communicate with nurses on sending unit
  - Nurses already have planned schedules and little time to take other admits
- Some patients need a nurse with specific training
- Lack of available nurses

**Sending Unit Delays in Discharging a Patient**
- Nurses occupied with other patients or personal needs
  - Nurses have little time to complete and send report
  - Nurses have little time to communicate with nurses on UH-6A
- Nurses unaware of patient discharge approval
- Nurses do not have the time to take an admit
- Physician must complete discharge order
- Lack of available nurses
- Patient waiting on procedure or already in a procedure
- Physician must medically approve the patient for admission into UH-6A

**Patient Transportation Delays**
- Patient not ready for transfer
- Patient transfer not considered a priority
- Patient transportation not called

**UH-6A Housekeeping Delays**
- Patient being discharged has not left the room
- Equipment needs to be moved out of the room
- Bed tracking or mainframe down
- May be understaffed
Utilization Review Delays

- Insurance approval has 24-48 hour turnaround time
- Insurance requirements vary based on insurance company
- Utilization Review manually gets information from patient chart
  - Patients charts are not always up to date
  - Utilization Review must contact physician to update chart
- Business office verifies patient’s insurance benefits on day of possible admissions to UH-6A
- Insurance company cannot read patient’s information
- Hospital physician approves patient to go to rehabilitation unit but patient does not meet the insurance company’s criteria

Analysis of Patient Arrival Times Reveal Conflicting Times

We have examined several times for patient arrival. The ideal arrival time for a patient has been identified as 1:00 pm – 2:30 pm from a nursing perspective. By this time the nurses have completed most of the care for the patients that are already residents in UH-6A. Between 7:00 am and 10:30 am, the nurses are preparing the patients for therapy, distributing medication, and passing out breakfast. From 12:00 pm until 1:00 pm, the patients are back on UH-6A and they must be given their lunch. By 1:30 pm, all of the patients are back in their therapy sessions. If the number of patients that will be on UH-6A by 2:30 pm is known, UH-6A would be able to determine the staffing needed for the evening.

We have also identified arrival times that may be troublesome and conflicting. We have found that 3:00 pm would not be a good arrival time because this is the time that the shift changes. The nurses would not be able to handle new admits at this time because they are busy finishing patient care and preparing reports for the next shift.

Arrival times after 10:00 am are not good from both a patient care perspective as well as a cost perspective. Patients are not able to receive their 3 hours of needed therapy for the day. As a result, UH-6A is not able to collect fees associated with the day of admission. Therefore, if the times available for therapy remain as they are now, the ideal arrival time from an economic stand point would be before 10:00 am. This would allow 3 to 4 hours to admit a patient and get them settled before they go to therapy. Because patients being transferred from other units with the University Hospital are treated as new admits and not just transfers, several tasks need to be completely redone. They include:

- Admission assessments by the physician, nurse, and all therapists who receive a consultation must be completed
- A new chart must be started
- A new advance directive declaration form must be completed
- The pain education form must be discussed
- All medical orders must be rewritten including dietary needs
**Analysis of Historic Data**

Based on the analysis of the historic admissions time data, 25% of the admissions for UH-6A are patients coming from UH-4A, Neurology/Neurosurgery, and 23% are patients coming from UH-5A, Ortho/Trauma/Urology. As shown in the Figure 2, UH-6A receives majority of patients from UH-4A and UH-5A.

![Distribution of Discharging Unit Location](image)

**Figure 2: Distribution of patients coming to UH-6A from other units within UMH**

We have concluded that the length of delay between insurance approval and patient arrival is too long because the delay causes the patient to arrive too late in the day. The delay leaves no time for the patient to arrive, get settled and receive the care and clearances needed to receive the required 3 hours of therapy because therapy sessions end at 4:00 pm. The average medical approval time was 10:05 am, average insurance approval time was 11:24 am and the average time the patient actually arrived to UH-6A was 4:27 pm.
Figure 3: Timeline of average task completion times

As it can be seen from the timeline above, there are several gaps between the times different tasks are completed in the admissions process. If the medical approval time were earlier, the patient insurance approval time could be earlier. We also determined that the average time of delay between the time insurance is approved and the time the patient arrives to UH-6A is 5 hours and 15 minutes. This illustrates that several internal delays exist. These delays may result from understaffing, non-standardized processes, and/or late discharge times for current UH-6A patients. After analyzing the data based on the discharging unit, we noticed that there is no significant difference in the average arrival to UH-6A time, insurance approval time, or medical approval time.

Analysis of Discharge and Admission Time Distribution Reveals Problems

Using admission times to UH-6A and discharge times from UH-6A we developed a distribution graph of both times as shown in Figure 4. This enabled us to compare the average admission time to the average discharge time. The average discharge time was 1:51 pm. When compared to the average arrival time, we can conclude that if patients are not leaving UH-6A on average until 1:51 pm, new patients cannot arrive until at least that time, which causes a problem because a patient arriving that late in the day will not be able to receive all 3 hours of therapy required.
To analyze the distribution of patient admissions by day of the week, we used the complete sample of historical data (N = 529) rather than the amended set used for all other calculations (N = 393). The data omitted from the amended set comprises patients who were admitted to UH-6A from outside the hospital and patients whose medical and/or insurance approval times are unavailable or outside of the scope of this analysis. However, to effectively analyze admission volume and distribution, these previously excluded data were included here. For the 56 week period analyzed (January 2005 – January 2006) a total of 529 patients were admitted to UH-6A with an average of 9.45 patients per week. Figure 5 shows the average number of patients admitted each day of the week.
Figure 5 - Average number of patients admitted to UH-6A each weekday

As shown in Figure 5, the average number of patients admitted is lowest on Wednesday with an average of 1.71 patients and highest on Friday with an average of 2.34 patients.

Cost Analysis Reveals Lost Revenue

Based on the cost information provided to us by the Clinical Information and Decision Support Services (CIDSS), the average charge per patient for the day of admission is $1,636.27. The hospital receives 58% of these charges, which is $949.03 per patient. When a patient does not receive 3 hours of therapy on the day of admission, insurance companies will not pay for the day of admission. Due to the delays in the admission process and therapy ending at 4pm, the hospital is rarely able to charge for the day of admission. The hospital must pay for that day without receiving any payment. A detailed listing of charges involved on admission day can be found in Appendix A.

Findings from Patient Tracking

The sample consisted of patients admitted to UH-6A from March 13, 2006 to March 24, 2006. The resulting sample size was 20 patients. The average arrival time was 5:21 pm for patients that were tracked during the 2 week period. Below is a table of time averages for steps involved in the process.
There is a time gap of 6 hours and 26 minutes between the patient’s insurance approval and the time the patient actually arrives to UH-6A. There is a 16 minute difference between the time a patient is discharged from their sending unit and their arrival time to UH-6A. Based on this, we conclude that no delay exists in the actual moving process of the patients. Also, the average time between medical clearance and insurance approval of 26 minutes does not show that insurance approval has caused a large delay in the process, although we can not assume this to be true for all cases. The times that tasks are completed in the admissions process do not allow for the patient to receive their 3 hours of therapy for the day and in response they do no allow for UH-6A to receive payment for the day of admission. Medically clearing a patient at 10:28 am does not allow for the other steps in the process to be completed for the patient to arrive at UH-6A to receive their therapy.

We found that 35% of patients arriving to UH-6A were from UH-4A. The distribution of this unit along with the other discharging units from the two week period can be found in figure 7.
During the tracking process, there were 13 main sources of delay. The frequencies of the delays are shown below in Figure 8.
Legend:

<table>
<thead>
<tr>
<th>Delay</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Physician Closing Discharge Papers</td>
</tr>
<tr>
<td>B</td>
<td>Room on UH-6A not ready- needed cleaning</td>
</tr>
<tr>
<td>C</td>
<td>Nurses Report</td>
</tr>
<tr>
<td>D</td>
<td>Room on UH-6A not ready-pending discharge of current patient</td>
</tr>
<tr>
<td></td>
<td>Patient's medical needs had to be taken care of before going to UH-6A</td>
</tr>
<tr>
<td>E</td>
<td>Room on UH-6A not ready-construction</td>
</tr>
<tr>
<td>F</td>
<td>Waiting for discharge on sending unit</td>
</tr>
<tr>
<td>G</td>
<td>Insurance Approval</td>
</tr>
<tr>
<td>H</td>
<td>Lack of notification to Environmental Services for room cleaning</td>
</tr>
<tr>
<td>I</td>
<td>Time availability of nurses</td>
</tr>
<tr>
<td>J</td>
<td>Packing patient up to go to UH-6A</td>
</tr>
<tr>
<td>K</td>
<td>Waiting for transport</td>
</tr>
</tbody>
</table>

The delay that poses the biggest issue in admitting patients to UH-6A is the completion of discharge papers by the physicians. There is also a large issue with the beds on UH-6A not being available because they needed cleaning.

Recommendations

Based on our findings and conclusions we have made several recommendations regarding our project. Our recommendations include the following: change therapy session times; develop new insurance procedures; develop a patient discharge time; develop an easier process for utilization review; reduce admissions time; add additional beds to UH-6A; and improve the communication among hospital employees. These recommendations will help reduce the process delays which will increase patient throughput and reduce hospital costs.

Alter Therapy Session Time

We recommend that UH-6A change their original therapy hours to 11:00 am until 7:00 pm or offer additional therapy sessions that run from 4:00 pm until 8:00 pm. By offering new therapy session times, the patients daily therapy needs will be met on admissions day and UH-6A would be able to receive compensation for this day. The University Hospital would need to complete a cost-benefit analysis to determine profitability of this recommendation.

Develop New Procedure for Insurance

The average time between insurance and medical approval time was 5 hours and 46 minutes. The insurance approval process involves a lot of back and forth communication between the insurance company and Utilization Review. Utilization Review would benefit from the patients' insurance benefits being checked for therapy benefits when the patient is first admitted to the hospital and not just to UH-6A. We also recommend that
the insurance companies allow each patient 24 hours from time of arrival to UH-6A to receive 3 hours of therapy.

Utilization Review has a good idea of what patients will be accepted to the rehabilitation unit. It may also be beneficial for those patients to be accepted into the rehabilitation unit before insurance approval. There is some risk to this recommendation; therefore, a financial analysis would have to be conducted to determine if this recommendation is feasible.

**Set Departure Time for Existing UH-6A Patients**

Waiting for patients to leave their beds to prepare for the new arrival can present delays. The bed to which the new patient has been assigned must first be vacated by the patient currently in the bed. The average discharge time was found to be 1:51 pm; therefore, a set departure time could be implemented to resolve this issue. A patient discharge lounge could be created for those patients that are not able to be picked up by the suggested departure time.

**Develop Easier Process for Utilization Review**

The Utilization Review representative spends a lot of time running from floor to floor collecting the data needed to complete the necessary paperwork for insurance approval. Placing the physical therapy/occupational therapy (PT/OT) notes online for easy review would help alleviate this issue. It is the understanding of the team that this recommendation is currently being implemented.

**Reduce Admissions Process Time**

As previously explained, some admissions tasks need to be redone by UH-6A when admitting a new patient. These tasks could be completed in the actual discharging unit. If those tasks are able to be carried over for at least one day, such as dietary needs, early completion of admission tasks would save a lot of time in this part of the process. We also recommend that the physicians evaluate the patients by visiting the discharging units prior to the patients' admission to UH-6A.

**Allocate More Beds to UH-6A**

Currently UH-6A has an average occupancy of 90% or more. Therefore, possible admits must wait for current rehabilitation patients to be discharged before they can be admitted to UH-6A. If more beds were allocated to UH-6A, occupancy would be reduced and possible admits could be admitted sooner.

**Improve Communication System**

There is a lack of communication between different parties involved in the admissions process. A system should be implemented that will notify a particular party when their
part of the admissions process is ready to be completed. It would also be beneficial for everyone involved to be aware of the entire process and not just their part of the process. This would make them more aware of delays and consequences that arise when their tasks are not completed in a timely manner. Therefore, a detailed admissions checklist of tasks and completion time should be developed. This would allow the employees to be aware of what steps have been completed and what steps need to be completed.

We also recommend setting up a discharge checklist to more efficiently discharge patients from UH-6A to allow for the new admits. There is an issue with communicating that a patient is ready to be picked up by family members or another facility. If the patient’s transportation is not notified, they will not be able to pick up the patient in a timely manner. A checklist of tasks and time completion for the discharge would help to smooth out this process.

**Impact of Recommendations**

The following is a list of outcomes expected to come from the implantation of our recommendations:

- More efficient discharge and admissions processes
- Improve patient care by creating more time
- Better communication between entities within hospital
- Increase UH-6A revenue
- Create readily available beds within UH-6A and University Hospital in general

Also, if the recommendations listed above are implemented, the hospital will be able to decrease costs and increase payments. Below is a table of recommendation options and an estimate of the affect they will have on hospital charges and payments.

<table>
<thead>
<tr>
<th>Option</th>
<th># of Patients Accommodated</th>
<th>Hospital Charges (per year)</th>
<th>Payments to Hospital (per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Add more beds to UH-6A</td>
<td>188</td>
<td>$527,346.45</td>
<td>$305,860.94</td>
</tr>
<tr>
<td>2. Insurance gives patient 24 hours to receive 3 hours of therapy (24 hr period starts at time of arrival)</td>
<td>188</td>
<td>$527,346.45</td>
<td>$305,860.94</td>
</tr>
<tr>
<td>3. Implement evening therapy session (Patient arrive to UH-6A by 2:00pm)</td>
<td>42</td>
<td>$117,811.44</td>
<td>$68,330.64</td>
</tr>
<tr>
<td>4. Suggest departure time for existing patients (10:00am) and Reduce admission time for incoming patients (2 hours)</td>
<td>40</td>
<td>$112,201.37</td>
<td>$65,076.80</td>
</tr>
</tbody>
</table>

**Note:**

University of Michigan Hospitals and Health Centers
Sample size: 188 patients
Sample period: FY2006 (July - January) (7 months)
Hospital day of admission charge per patient= $1,636.27 (See Appendix A for details)
Payment to hospital for day of admission= 58% of charges= $949.03

Table 1: Cost-Benefit Analysis of Recommendations
The recommendations illustrated above will result in costs for new hospital beds which will require more equipment, rooms, and more nurses depending on the number of beds. There will also be a cost associated with more therapists and/or longer hours for the therapists. To enforce a departure time for current UH-6A patients, the nursing staff must be trained to make the new departure time a part of the culture.

As illustrated in the table above, recommendations 1 and 2 will have the largest affect. As the number of recommendations implemented increases, the amount of money saved and payments made increases. If the hospital does not implement any of these recommendations, they will continue to lose money because of the lack of therapy received on the day of admission. A cost analysis must be made to determine whether the money saved by each of the recommendations will exceed the costs of the recommendations.

In conducting our research and developing this report we have followed Confidentiality and Protected Health Information (PHI) rules. The report includes only summary information and does not include protected health information.

Support from Operating Entities

The Clinical Nurse Manager of UH-6A, our client, provided ongoing details of the problem, requirements, expectations, patient insurance approval times, patient admission times, and contact information. She acted as a liaison between our team and other individuals in UH-6A to ensure full cooperation. She also approved overtime, where appropriate, for each of her staff who participated in any interviews.

Our project coordinator was our guide and mentor, and helped us to maintain analytical quality and a positive client relationship throughout this project. She gave us feedback on our progress and helped us improve our professional skills.
Appendix A
Figure 9: Flowchart of Discharge Process for UMH Units
Figure 10: Flowchart of Admissions Coordinator Process

1. Obtain patient data
2. Obtain insurance information
3. Ask if a private room is needed
4. Medically approved?
   - No
     - Repeat a, b, c, and e
   - Yes
     - a. Page 6A senior
     - b. Page/call 6A Desk Clerk
     - c. Page attending physician
     - d. Schedule admission on computer
     - e. E-mail information to PM&R admit. Print copy and attach to worksheet.
     - g. Page Patient Accounts to PAD admission
      1. Has insurance been approved?
         - No
           - Repeat a, b, c, and e
         - Yes
           - Notify sending unit that patient is medically and insurance approved.
           - Page attending physician that "STAT Discharge orders are needed"
Clerk receives list of possible admits from Admissions Coordinator (AC) and notifies Charge Nurse (CN)

- Yes
  - Medically approved?
    - No
      - Ventilator required?
        - No
          - Vent. room available?
            - No
              - * Patient assigned to room
            - Yes
              - Insurance approved?
                - No
                  - Private room required?
                    - Yes
                      - Private room available?
                        - Yes
                          - Patient assigned to room*
                        - No
                          - Semi-private room available?
                            - Yes
                              - Occupied?
                                - No
                                  - * Patient assigned to room
                                - Yes
                                  - Same sex?
                                    - No
                                      - Room changes possible?
                                        - No
                                          - * Patient assigned to room
                                        - Yes
                                          - * Patient assigned to room
                                    - Yes
                                      - Room changes possible?
                                        - Yes
                                          - * Patient assigned to room
                                        - No
                                          - * Patient assigned to room
                              - * Patient assigned to room
                            - No
                              - Patient is brought to UH-6A
                                - No
                                  - Environmental Services is called
                                - Yes
                                  - Nurse and patient approve of room?
                                    - Yes
                                      - Is room ready?
                                        - No
                                          - * Patient assigned to room
                                        - Yes
                                          - Patient is brought to UH-6A
                                    - No
                                      - Clerk calls admitting and new patient’s information is put into the computer

Source: Personnel Interviews
Created by: Project Team

Figure 11: Flowchart of UH-6A Admissions Process
Patient Tracking Process Log

Student name: ________________________________

Date: ________________

Time: ________________

Shift no.: ________________

Time 6A considered patient as possible admit: ________

Insurance approval time: ________________

Medical approval time:______________

Patient discharging unit: ________________

Patient discharge time: ________________

6A arrival time: _________________________

What steps in process need to be completed?

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

What delays have been experienced in the process?

(Identify job title of person identifying delays)

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

Figure 12: Data Collection Tool Used During Patient Tracking
### Charges for Day of Admission

**University of Michigan Hospitals and Health Centers**  
Discharges from PMA during FY2006 (July - January) (7 months)  
Activity for Day 1 and Day 2  
Source: TSI Patient Level Dataset Rpt: DAYSTAYCS2

<table>
<thead>
<tr>
<th>Discharge Service</th>
<th>Day of Stay</th>
<th>Department</th>
<th>Contrib. Cases</th>
<th>CDM Quantity</th>
<th>Charge</th>
<th>Direct Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMA PHYSICAL MED REHAB</td>
<td>1</td>
<td>204430 INPATIENT PHARMACY SVCS</td>
<td>10</td>
<td>2.38</td>
<td>6.18</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>204700 RESP CARDIO SERVICES-UH</td>
<td>2</td>
<td>0.04</td>
<td>3.19</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>204950 UMH MATL SVCS PAT EQUIP</td>
<td>4</td>
<td>0.03</td>
<td>2.27</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>205330 EKG FAC</td>
<td>1</td>
<td>0.01</td>
<td>0.61</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>205730 PM&amp;R PHYS THERAPY-UH</td>
<td>188</td>
<td>3.00</td>
<td>189.00</td>
<td>68.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>205940 RADIOLOGY-IP GEN IMAG</td>
<td>1</td>
<td>0.02</td>
<td>2.65</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>206030 BEDSIDE TESTING</td>
<td>3</td>
<td>0.03</td>
<td>0.64</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>206340 6A UH NURSING</td>
<td>188</td>
<td>1.00</td>
<td>1426.11</td>
<td>574.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>207520 CHEMICAL PATHOLOGY</td>
<td>2</td>
<td>0.03</td>
<td>1.67</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>207530 MICROBIOL PATHOLOGY</td>
<td>1</td>
<td>0.01</td>
<td>0.99</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>207560 HEMATOPATHOLOGY</td>
<td>3</td>
<td>0.03</td>
<td>1.05</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>207720 RADIOISO PATH/ASSAY</td>
<td>2</td>
<td>0.02</td>
<td>1.92</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>TOTAL DAY 1</strong></td>
<td><strong>188</strong></td>
<td></td>
<td></td>
<td><strong>6.59</strong></td>
<td><strong>1636.27</strong></td>
<td><strong>645.81</strong></td>
</tr>
</tbody>
</table>

Figure 13: Charges for First Day of Admission

### Statistics for Patients Arriving to UH-6A from January 2005- January 2006

![Average Arrival Time](image)

Figure 14: Average Arrival Time by Discharging Unit
Figure 15: Average Insurance Approval Time by Discharging Unit

Figure 16: Average Medical Approval Time by Discharging Unit