Team 11 Final Report:

Analysis of Therapists’ Non-Patient Care Activities
Pediatric Physical & Occupational Therapy Inpatient Department
C.S. Mott Children’s Hospital

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Introduction

In 2009, an institutional effort was put in place at the University of Michigan Health System (UMHS) to match productivity levels achieved in 2007, which was the year the hospital perceived expenses to have been optimally aligned with overall productivity standards. This report deals specifically with the Pediatric Physical and Occupational Therapy (PT/OT) Inpatient Department at Charles Stewart Mott Children’s Hospital (Mott Hospital). In order to ascertain the drivers behind current productivity standards, the Director of PT/OT at the University of Michigan Health System (UMHS), of which Mott Hospital is a subset, enlisted the expertise of a team of Industrial and Operations Engineering (IOE) students from the University of Michigan to examine the departmental workflow of the PT/OT therapists at Mott Hospital and identify the key productivity drivers. The team spent twelve weeks on the project between the months of September and December (2009) during which, the end-to-end operating model of the PT/OT Department at Mott Hospital was analyzed in depth. The extent of the analysis was limited to the non-patient care activities of the inpatient therapists, technician and administrative assistant. The Director of PT/OT at Mott expressed the desire to have the therapists run self-initiated process improvement (lean) projects which would need to be supported by preliminary data collection, analysis and discoveries made by the student team.

Methodology

The team began the project with an emphasis on active engagement with the therapists. The therapists were interviewed in order for the team to get a sense of the department and its processes. It also allowed the team to identify processes that were inefficient through the therapist’s perspective. This provided the focus for the next step which was to observe the therapists in their every-day routine. Mott Hospital will be moving to a new facility within the next 2 years. The team therefore has focused our observations and analysis around processes and methods rather than physical elements such as travel time and location studies. To establish a time breakdown of the therapist’s activities, a two-pronged approach was adopted. Firstly, the team timed the therapists as part of the observation process. Secondly, an amendment to the billing sheets used by the department allowed the therapists to fill in the amount of time spent daily doing non-patient care activities. This data was collected over the month of October. The team was able to use this data to perform a billing sheet analysis to obtain a breakdown of the therapists’ time.

A new referral order response time analysis was conducted to determine if the therapists were consistently meeting the internal 24 hour target turnaround time for new therapy orders. This was done by analyzing data from Carelink and Careweb for the month of October. The data was analyzed by the medical department that the order came from. By doing so, the team was able to determine which types of therapy orders were consistently exceeding the target.
To be able to determine the workload of the two types of therapists, a carry-over analysis was performed using data provided in Careweb and Carelink. The carry-over analysis investigated the change in census levels as well as the number of patients carried forward from one day to the next without being treated.

Based on the analysis of the departmental operating model as a whole, the team was able to identify areas of concern. The therapists were then surveyed to determine the extent of the inefficiencies and to investigate areas of opportunity for improvement.

**Results**

From the combined results of these two methods, it was ascertained that between 57% and 63% of the in-patient PT therapist’s time was spent on non-patient care activities while this range was between 52% and 56% for the in-patient OT therapists. Of all the non-patient care activities, documentation consumed the largest portion of time, taking no less than 23.7% and 23.1% of the average work day for the in-patient PT and OT therapists respectively. It is pertinent to note that the billing sheet analysis provided an extremely accurate representation of the amount of patient-care time as this was represented by the number of billable units recorded by the therapist. Billable units are one of the key drivers in determining departmental productivity.

From interviews with the staff and further observation, a current state map was created (presented within the report). The team found that the department faced inefficiencies with inventory management of toys and therapy aids. It was estimated that therapists spent approximately 44 minutes a day unsuccessfully looking for toys. This equates to 3 billable units which could have gone towards patient-care time. This is approximately the 1.5 patients in lost productivity per day.

To help this, the team proposed coaching the department technician in lean methodologies to allow for better management of the equipment. Surveys were also conducted to ascertain the frequency of use of toys and a list of toys that experience high usage is presented in this report.

The response time analysis showed that the mean service response time was 30.8 hours for the PTs and 58.9 hours for OTs. This result was due to certain types of patients consistently experiencing very long response times. However, OT met the 24 hour target 65% of the time while PTs met the target 64% of the time.

The carry-over analysis helped the team to understand the disparity in orders over the weekend as opposed to during the week. The team also investigated the effect of the carry-overs with regards to staffing over the weekend.

Further observation showed that the department was regularly staffed with volunteers, who did not seem to have specific job scopes. The team found that these volunteers could be better
applied in the department to assist with providing a seamless support service for the therapist when it comes to cleaning toys and re-stocking supplies.

**Implementation Approach**

The PT/OT Department at Mott Hospital will be sending two of its in-patient therapists and the technician to a 4 Day Lean Certification course which will equip them with the necessary tools to initiate and drive projects within the department. To support their efforts, the team has various preliminary analyses on new referral carry-over, therapist response times to new orders, documentation and staff utilization (capacity vs. demand) which are to be used as productivity and service delivery baselines for comparison following improvements.

The certification course will serve separate purposes for the therapists and for the technician. The therapists should focus their lean improvement work on the processes surrounding documentation which has been deemed to be their most significant inefficiency. The technician should adopt a focus for his lean improvement work with regards to inventory management to maintain a clean, well-stocked and comprehensive system to provide toys and therapy aids to therapists.

A supplement to the report in the form of a “data sheet” is also enclosed and it contains purely the data collected by the team and the relevant analysis which will be circulated to the therapists. This data will be used to bolster any future proposals that may be made with regards to improving efficiency in the department.
1. Introduction
Over the past year, the Director of Physical and Occupational Therapy at the University of Michigan Health System (UMHS) has worked with a Quality System Lean Coach to examine the Physical and Occupational Therapy (PT/OT) Department at the University Hospital (UH). The Director, Lean Coach, and therapists were able to implement changes that made the PT/OT Department at UH more efficient.

The Director also saw efficiency improvement opportunities that existed in the Pediatric (PT/OT) Department at Charles Stewart Mott Children’s Hospital (Mott Hospital). Consequently, the Director asked the team of Industrial and Operations Engineering (IOE) students to examine the PT/OT Department at Mott Hospital from a lean prospective. The team was asked to provide visibility of the current state of the Mott PT/OT Department and to identify areas where improvement opportunities exist. The purpose of this report is to present the team’s findings.

2. Project Background
The institutional effort at UMHS to match the 2009 productivity levels to those of 2007 created the need to examine many of the individual departments. The Director of Physical and Occupational Therapy at (UMHS) oversaw a thorough examination of the PT/OT Department at UH, which resulted in substantial efficiency improvements. The Director wanted to examine the PT/OT Department at Mott Hospital to determine if similar efficiency improvements could be gained. The purpose of the project was to provide a clear understanding of the current state of the Department. The team worked under the understanding that areas of inefficiency should be noted, however, the implementation of any improvement would be completed internally, by the therapists. The Director of PT/OT at Mott expressed the desire to have the therapists run self-initiated process improvement (lean) projects which would need to be supported by preliminary data collection, analysis and discoveries made by the student team. Goals and Objectives

The primary goal of the project was to provide visibility of the current state and identify possible efficiency improvement opportunities for the Mott PT/OT Department. In order to accomplish this primary goal, the team fulfilled the following objectives:

- Gathered an understanding of the areas that the therapists believed were inefficient
- Determined the breakdown of the therapists time via 1) observation and 2) billing sheet data
- Determined the precision of the productivity sheets filled out by the therapists
- Evaluated the response time to new referrals
- Surveyed the therapists regarding their feelings toward new equipment and new documentation templates
- Examined current inventory management system
- Observed technician utilization (demand vs. capacity)
3. Project Scope
The project scope included the daily activities of the physical and occupational therapists within the Pediatric PT/OT Department at Mott Hospital. The project scope also included the daily activities of the technician in the Pediatric PT/OT Department.

The project scope excluded the examination of patient care time. The project also did not examine therapist job tasks performed outside the realm of the Inpatient Pediatric PT/OT Department.

4. Methodology
The team initially gathered qualitative data through observation and interviews. During the initial week of the project, it was identified that therapist support would be essential for success. The observations and interviews were guided by three important principles of Process (GEMBA) Observation:

- On-site observation of work processes
- Asking relevant questions
- Respecting the therapists and staff

Through focusing on these three principles, the team felt that the therapists would be most helpful and cooperative throughout the project.

Next, the team quantified and summarized all of the interview and observation information that had been recorded during the observation phase. Also, the awaiting new referral (carry-over), response time, and billing sheet data were provided to the team via the Coordinator. The data was taken from Carelink, and was collected over the month of October (2009). The data sets were used to analyze the carry-over of new referrals, the therapist’s response time to new referrals, and the breakdown of therapist time (via observation data and self-recording billing sheet data).

The team initially held a meeting on October 1st, 2009 with inpatient therapists, the department technician and the department supervisor, outlining the methods of the project. The purpose of the initial therapist meeting was to avoid miscommunication and to build trust with the therapists. Also, in an effort to keep the therapists involved, the team created two formal status updates over the course of the project to inform the therapists of the team’s current progress. These status updates can be found in Appendix A.

4.1. Performed Literature Search
The team performed a preliminary literature search with regards to operations management in healthcare. One of the major problems faced by healthcare providers when it comes to efficiency
is strategically defining and measuring efficiency and its drivers\textsuperscript{1}. The article dealt with approaching a healthcare project in terms of efficiency measurement.

The Project Coordinator had also done a project similar to the one the student team undertook except that it focused on the therapists as UH instead of Mott Hospital. The project was reviewed closely by the team and many of the methodologies and data collection processes were found to be pertinent to the current project. The project by the Project Coordinator is shown in Appendix B.

\textbf{4.2. Interviewed Staff Members}

Interviews were conducted with all of the Pediatric PT/OT therapists on October 5\textsuperscript{th}, 2009 and on October 7\textsuperscript{th}, 2009 (inpatient and outpatient). The format of the interviews was casual and open-ended, with each interview lasting approximately fifteen minutes. The data gathered from the interviews was qualitative and subjective.

Six inpatient therapists were interviewed- three PTs and three OTs. The purpose of the inpatient interviews was to identify processes that were perceived by the therapists as areas of inefficiency. The team also interviewed six outpatient therapists- five PTs and one OT. The purpose of the outpatient interviews was to determine the problem area that could be focused on by a future student team. The Department Supervisor, Department Technician, and Department Clerk were also interviewed.

Appendix C shows some general questions that were asked by the team, as well as the interview schedule.

\textbf{4.3. Observed Therapist’s Time}

While shadowing the therapists, the team of IOE students noted the amount of time that a therapist spent doing each of his/her daily activities. Observations were completed on the following days:

- Tuesday October 13\textsuperscript{th}
- Wednesday October 14\textsuperscript{th}
- Tuesday October 20\textsuperscript{th}
- Thursday October 22\textsuperscript{nd}
- Monday October 26\textsuperscript{th}

The total observation time was over 44 hours, and was split between the three team members. The categories that were commonly observed are summarized in Table 1.

Table 1: Shadow Categories

<table>
<thead>
<tr>
<th>Therapist Activity</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Care Time</td>
<td>The amount of time a therapist spends administering therapy and/or professionally transporting a patient</td>
</tr>
<tr>
<td>Documentation</td>
<td>The amount of time a therapist spends in Carelink marking the patient as done, in Careweb typing up patient notes and/or creating home care instructions</td>
</tr>
<tr>
<td>Meeting</td>
<td>The amount of time a therapist spends in a required department meeting and/or a “Patient Rehab Meeting” (held on Tuesdays)</td>
</tr>
<tr>
<td>Scheduling on Billing Sheet</td>
<td>The amount of time a therapists spends scheduling his/her day (the name of the patient, planned appointment time, and location of the patient are written down on the billing sheet)</td>
</tr>
<tr>
<td>Travel Time</td>
<td>The amount of time a therapists spends traveling to and from an appointment (does not include patient transportation time). This time is recorded, even if the patient was not present in the room when the therapist arrived.</td>
</tr>
<tr>
<td>Reading Charts</td>
<td>The amount of time a therapists spends familiarizing himself/herself with patient information</td>
</tr>
<tr>
<td>Communications</td>
<td>The amount of time a therapists spends communicating with other therapists, nurses, physicians, and/or supervisor</td>
</tr>
<tr>
<td>Completing Billing Sheet</td>
<td>The amount of time a therapists spends completing a Billing Sheet from the day before</td>
</tr>
<tr>
<td>Other</td>
<td>The category includes activities such as peer chart reviewing, showing other therapists certain computer programs, eating lunch, signing notes for therapist assistants, and ordering equipment</td>
</tr>
<tr>
<td>Equipment</td>
<td>The amount of time a therapists spends retrieving and/or cleaning the equipment</td>
</tr>
</tbody>
</table>

4.4. Performed Billing Sheet Analysis
The billing sheet data was provided to the team via the Coordinator. The data was collected from October 1-October 31, 2009 and was purely quantitative. Each day, the therapist picks up a new billing sheet and records the required data as the day progresses. The two main parts of the billing sheet are 1) billable unit information and 2) productivity information. The billing sheets (shown in Appendix D) are color coordinated - PT’s billing sheet is blue and OT’s billing sheet is peach. At 8 am the following day, the therapist must turn his/her billing sheet into the Department Clerk. The Department Clerk takes the hardcopy of the billing sheets and types the necessary information into the database.

The team looked at the units billed per therapist per day as well as the patients seen per therapist per day. To estimate the units billed per therapist per day, the hours worked for the month were totaled and divided by 8 to find the total number of 8 hour work days. Then the units billed for the month were totaled and then divided by the number of 8 hour work days. The estimate of patients seen per therapist per day was similarly calculated. The total number of patients seen was divided by the same number of 8 hour work days.
The team also analyzed the total number of patients by day of the week. The total average census per day, the average number of patients scheduled per day, the actual number of patients seen in the day, and the average number of new referrals that carried over to the next day were all considered during the billing sheet analysis. This information was organized into a stacked bar chart, representing a snapshot look at therapist’s ability to meet current demand, by day of the week.

Finally, the team analyzed the breakdown of the therapists’ workday in terms of patient care and non-patient care times. Two methods were used for this analysis. In Method One, the total time of non-patient care activities was summed and subtracted from the total care time. However, this measure of actual patient care time is overstated as it assumes 100% accurate documentation of therapists time which the team was informed was not the case. In Method Two, the number of units billed was multiplied by ¼ hours (15 minutes). This was again compared to the total care time. These results of the two methods were then merged into one graph. The difference between the two was then labeled as “Unaccounted”.

4.5. Surveyed the Therapists
The team created and distributed the surveys to the Physical and Occupational Therapy Department on October 24th, 2009. The surveys focused on the optimal equipment supplies and specific documentation notes that the therapists would like to see updated. The completed surveys can be found in Appendix E. The therapists were asked which types of equipment were needed and which templates should be updated in order to improve the efficiency of the documentation process. The surveys were then returned on October 30th, 2009. One team member met with the therapists the following Wednesday (November 4th, 2009) to clarify some of the responses.

4.6. Observed Documentation Process
Through the initial interviews with the therapists, it was noted that documentation was a significant part of their daily workload. The team observed the documentation process and was able to determine the different types of reports that are commonly written. The average time it takes to complete each type of note was estimated by the therapists. Therefore data collected during this phase was subjective and not verified by the team.

4.7. Examined Inventory Management Process
The team observed therapists entering and leaving the PT/OT gym area over a period of five hours and recorded the time it took for the therapist to locate and pack the desired equipment. The team also gathered quantitative estimates from the therapist regarding 1) the number of times a therapist can’t find a clean toy in the equipment area and 2) the number of times the therapists go the equipment area (to gather the needed equipment) in a given day.
4.8. Observed Technician Utilization
The team observed the technician and his job scope over a span of eight hours. The technician’s primary responsibility is to restock expendable supplies, ensure that toys and therapy aids are sanitized as well as to ensure that all therapy equipment is functional and in good condition. This includes casting machines and the crash cart. The technician also manages the volunteers.

4.9. Performed Carry-Over Analysis
The team was provided with carry-over data for both PT and OT (separate data sets) that was collected from October 1, 2009- November 5, 2009. The data was collected and recorded by the administrative assistant at UH. The administrative assistant was instructed to go into CareLink and record any new referral order that did not have a therapist name reported. This number was reported as “Awaiting New Referrals”. He was also instructed to record “Total PM Census,” which was defined as the number of patients listed in CareLink, in which doctor had put in an order for therapy. The data was collected around 3:15 PM on a daily basis.

4.10. Performed Response Time Analysis
The team was provided with data from Carelink on the response time of therapists to new referrals (PT and OT separate). The process for a new referral is as follows:

1. A therapy order is placed via Carelink
2. The order is delegated internally to one of the therapists, usually matching the patient condition with the individual therapist’ specialty.
3. The assigned therapist will see the patient and then write a note on the treatment which is then posted on Carelink.

The response time is defined at the time between the point that the order for a new referral is placed on Carelink to the time that the follow-up note is written and posted by the therapist. The PT/OT department has an internal target of “next day service”. This means that the follow-up note should be posted on Carelink by end of the day after the initial treatment request was uploaded. Through conversations with therapists regarding customer expectations, the team has taken the internal target to be 24 hours.

The data collected was from the October 1- October 31, 2009. The response times were broken down by the different wards in Mott Hospital. This was to further stratify the different types of treatments and help identify categories of patients who consistently experienced longer response times.

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2 Note: Some doctors request therapy orders before the patient is able to receive therapy
5. Results
The main purpose of the project was to provide visibility to the current state of the PT/OT Pediatric Department. The results presented below are meant to provide insight into the department from a number of perspectives. As the team gathered an increased understanding of the current state of the department, the following two main efficiency improvement opportunities became apparent:

1) The need for an Inventory Management System
2) The optimization and standardization of documentation templates

The results provide both qualitative and quantitative evidence of these efficiency improvement opportunities.

5.1. Performed Literature Search
The article proved to be extremely informative with regards to measuring and defining efficiency. It is a challenge to improve efficiency without a consensus on what constitutes efficiency, how to measure it, and what actions must be taken to improve it. This is especially apparent when the definitions change depending on who the stakeholder is. The article emphasizes utilizing the expertise of neutral, non-biased consultants to both define efficiency and to conduct transparent and impartial measurements.

A review of the Project Coordinator’s previous project with the therapy department at UH gave the team direction with regards to data collection and methods. The Project Coordinator presented his current state map in the form of a Gemba diagram which was one of the methodologies that the team adopted. The project also gave the team a list of relevant personnel at UH who were able to help with retrieving data from both Careweb and Carelink, since they were experience with the type of data required and the way that it should be broken down.

5.2. Interviewed Staff Members
In general, it seemed that both the inpatient and outpatient therapists encountered similar difficulties through-out their day. The primary issue that was discussed was documentation. One inpatient therapist reported, “CareWeb is inefficient and time consuming. The fields are not appropriately matched to the needs of the Mott PT/OT department, as there are irrelevant measures in the fixed templates that do not apply to pediatrics.” Another commonly reported issue, which was reported mostly by the OTs, was home care instructions. It was reported that standards for home care instructions are not clear and that the current methods for creating home care instructions varied greatly from therapist to therapist. The reported methods included the use of Microsoft Word, Microsoft PowerPoint, photocopied pages from books, and personalized digital photos.
Some of the therapists voiced concern that management and the team does not understand some of the elements of pediatric therapy, such as the need to bond with the patient prior to administrating therapy. For example, it was reported that, “Therapists need the ability to be flexible with time and scheduling to be able to allow for relationship building” and “there is no need for techs to assist with patient setup, as the therapist uses the time to bond with the child.”

5.3. Observed Therapist’s Time
Two types of information were gathered during therapist observation:
   1) Therapist Workflow
   2) Breakdown of Therapist Workload via Observation

5.3.1. Therapist Work Flow
The team observed that there was a large amount of variability in each of the therapist’s day. The variability stemmed from the number of patients, the type of patients, that age of the patients, and the patients schedules. Some observed improvement opportunities can be found on the current state diagram shown in Appendix F. Figure 1 shows the process that most therapists follow on a daily basis.

![Figure 1: Therapist Work Flow](image)

Arrive at Staff Pit
Most therapists generally arrive between 6:30 and 7:50. It was observed that a therapist usually arrives around the same time every day.

Finish Documentation and Billing Sheet from Day Before
The Billing Sheet from the Day Before must be turned-in to the clerk by 8 am the following day. Therefore, finish the billing sheet from the prior day is a high priority when the therapists first arrive. Also, most therapists use the billing sheet as a method for keeping track of whether the note for the patient has been completed. For example, a therapist might write down the patient registration number for a patient only after the note has been completed. The billing sheet for the therapists can be found in Appendix D.

Two opportunities for improving efficiency were consistently observed, and vocalized by the therapists firstly, the need for standardized note templates and secondly, the need for standardized home care instructions.

Schedule and Read Notes for Today
After the Billing Sheet from the prior day is turned in, the therapist pick-up a new billing sheet and uses it to schedule the patients for that day. Patient orders are listed in Carelink. If a therapist has seen a patient before, then his/her name and pager number is listed next to the patient’s name. If a new order appears in CareLink, then the group of inpatient therapists all read the notes for the patient, and decides which therapists will see the new patient. The decision is based on patient condition and therapist availability. Patients that are scheduled for rehabilitation therapy are scheduled through the clerk, and are listed on the back-side of the door in the Staff Pitt. Most therapists try to see his/her first patient by 8:30 am.

While scheduling the patients for the day, it was observed that there is no standardized scheduling method. In general, most therapists believed that the mornings were more ideal for patient appointments. It was reported that pediatric patients are often more tired and agitated in the afternoons. Therefore some therapists schedule new evaluations in the mornings, while other therapists schedule their more regular patients in the morning. Likewise, some therapists schedule the patient appointments for the entire day, while other therapists only schedule for morning patient appointments. Another difference among therapist scheduling, is that some therapists will schedule appointments for full hour blocks, while other therapists take into account that the patient will most likely be too tired to complete a full hour of therapy.

A bottleneck that was both observed a reported by the therapists was the need to communicate with the nurses, while completing scheduling. Unfortunately, the nurse shift change occurs at 8 am. Therefore, the therapists must wait until after 8 am to call up the nurse and let them know the time that the patient will be receiving therapy.

*Get Equipment and Travel to First Patient*

The equipment for patient appointments varies greatly from patient-to-patient. A patient’s condition, capability, likes/dislikes and goals must all be taken into account when selecting the equipment. The equipment is usually gathered from the gym, PT room, OT room, and/or cleaning closet that is located on a patient floor.

*Patient Care Time*

The activities completed during patient-care time are out of the scope of this project. However, it was observed that occasionally a therapist will travel to a patient only to find that the patient is not in the room. It was also observed that occasionally a patient will refuse to use the equipment a therapist brings, thus causing the therapist to retrieve new equipment.

*Documentation*

After a patient is seen, the therapist usually returns to the Staff Pit and completes the documentation for the patient. The computers that are available on each floor were rarely used to
complete documentation. It was reported that the “computers on the floors are never free and difficult to log into.”

### 5.3.2. Breakdown of Therapist Workload via Observation

The Process (GEMBA) observations were split between the PTs and the OTs. The Process (GEMBA) data shows the breakdown of the therapist’s workload based on the team’s observations.

**PT Process (GEMBA) Observations**

Figure 2 shows the observed amount of time spent completing each activity for inpatient PT therapists. The data shows that 37% of the inpatient PT therapists’ time is spent completing patient care activities, while 63% of the time is spent completing non-patient care activities. A large portion (24%) of the time spent on non-patient care activities is spent completing documentation.

![Figure 2: Breakdown of PT Time via Observation](image)

**OT Process (GEMBA) Observations**

Figure 3 shows the observed amount of time therapists spend completing each activity for Inpatient OT therapists. The data shows that 44.3% of the Inpatient OT therapists’ time is spent completing patient care activities, while 55.7% of the time is spent completing non-patient care activities. A large portion (23.1%) of the time spent on non-patient care activities is spent completing documentation.
5.4. Performed Billing Sheet Analysis

The billing sheet data provided two different forms of information 1) a breakdown of the therapist’s workload based on the billing sheet data (which was recorded by the therapists) and 2) therapist utilization compared to target utilization.

5.4.1 Breakdown of Therapist Workload via Billing Sheet Data

The team used two approaches to estimate the amount of patient care time from the billing sheets. First, the team summed the time each category of non-patient care time from the billing sheets. Then the total sum of all the non-patient care time was subtracted from the total time logged – giving us an estimate of patient care time. However, this measure of actual patient care time is overstated as it assumes 100% accurate documentation of therapists time which the team was informed was not the case.

Therefore, the team used a second approach to approximate the amount of patient care time. The team took the sum of all the billed units and multiplied by 0.25 hours (15 minutes) in order to get an approximation of patient care time. This measurement is more accurate as it relates to billing information which historically is documented without error by the therapists.

Finally, the team created a pie chart for both the PT and the OT billing sheet data. In the pie charts, the proportion of patient care time from the billed units is subtracted from the proportion of patient care time from the first method. The difference was categorized as “Unknown” non-
patient care time. In addition, all categories that were 1% or less were combined into the category “Other”.

Figure 4 shows that the proportion of time spent completing each activity for Inpatient PT therapists. The data shows that 43% of the Inpatient OT therapists’ time is spent completing patient care activities, while 57% of the time is spent completing non-patient care activities. The largest portion of non-patient care activity comes from documentation, which is 28%.

Figure 5 shows that the proportion of time spent completing each activity for inpatient OT therapists. The data shows that 48% of the inpatient OT therapists’ time is spent completing patient care activities, while 52% of the time is spent completing non-patient care activities. The largest portion of non-patient care activity comes from documentation, which is 13%. However, due to the fact that 27% of non-patient care time activities were unaccounted for, it is difficult to state with a great deal of accuracy where all the non-patient care time is being spent.

The data from the billing sheets is roughly equal to the data we found through our Process (GEMBA) observations. The proportion of patient care time is comparable for both PT and OT, and documentation was the largest amount of non-patient care time spent in both studies – making up nearly 30% of non patient care time.
Figures 6 and 7 show the percentage of time that the therapists spend on patient care activities for PT and OT according to both the observation and the billing sheet data.

**Observation Data**

**Billing Sheet Data**

**Figure 5: Breakdown of OT Time via Billing Sheet Data**
Sample Size = 57; October 1 - 31 2009; IOE 481
5.4.2. Therapist Utilization

The team analyzed both the units billed per therapist per day as well as the patients seen per therapist per day. To estimate of the Units billed per therapist per day, the total number of hours worked was first divided by 8 to find the total number of 8 hour work days. Then the total number of Units billed was divided by the number of 8 hour work days. The estimate of patients seen per therapist per day was similarly calculated. The total number of Patients seen was divided by the same number of 8 hour work days. A summary of the data is shown below in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>Physical Therapy</th>
<th>Occupational Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units/Day</td>
<td>13.789</td>
<td>15.402</td>
</tr>
<tr>
<td>Patients/Day</td>
<td>6.132</td>
<td>5.626</td>
</tr>
</tbody>
</table>

Next, the team created a stacked bar chart looking at five categories averaged per day of the week. Table 2 contains each category and how the team calculated the values.
Table 3: Five Categories and Explanations

<table>
<thead>
<tr>
<th>Category</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Total Census</td>
<td>Took Total Census of each day in October. Then averaged by day of the week.</td>
</tr>
<tr>
<td>Average Carry Over</td>
<td>Took Carry Over of each day in October. Then averaged by day of the week.</td>
</tr>
<tr>
<td>Scheduled Patients</td>
<td>Took scheduled number of patients of each day in October. Then averaged by day of the week.</td>
</tr>
<tr>
<td>Actual Patients Seen</td>
<td>Took the actual number of patients seen each day in October. Then averaged by day of the week.</td>
</tr>
<tr>
<td>Target Patients Seen</td>
<td>Took the average Patients/Day from Table 1 and multiplied by expected number of therapists for each day. Note: Weekend numbers are unreliable since many weekend orders are only done by necessity.</td>
</tr>
</tbody>
</table>

When looking at Figure 8, the team saw that PT scheduled over 70% of the patients per day, and were able to actually see over 80% of the scheduled patients. Since PT only has one therapist working over the weekends, the number on the weekends was significantly lower. Also, Actual Patients Seen per day approximately matches Target Patients seen per day every day except Mon.

![Figure 8: Average PT Patients by Day of Week](image)

*note: Average Total Census includes Average Carry Over and Schedule Patients

**Figure 8: Average PT Patients by Day of Week**
Sample Size = 108; October 1 - 31 2009; IOE 481

Figure 9 shows that OT scheduled approximately 50% of patients per day, and were able to actually see over 80% of the scheduled patients. The average total census numbers is larger than expected due to the Carelink data inevitably including the Children’s Speech. Since OT does not typically work on Saturdays and Sundays, there were no scheduled patients on those days. Also, actual patients seen per day approximately matches target patients seen per day every day except Wednesday.
5.5. Surveyed the Therapists
Through the surveys, the team found that many other departments borrowed equipment from the Physical and Occupational Therapist Department and failed to return the equipment. Also, without a standardized inventory system, many items were also lost since volunteer helpers would constantly misplace equipment. Therefore, in addition to an inventory management system, the department also needed additional equipment/toys. From the surveys, the therapists said that on average, they could not find the equipment they were looking for one out of three times. A complete list of the additional equipment that the therapists believe they need can be found in Appendix E.

5.6. Observed Documentation Process
Therapists spend a significant amount of time doing documentation on their orders. While this is a necessary compliance process, it could be handled more efficiently. Currently, PTs spend 23.3% of their time doing documentation while OTs spend 23.1%. The estimation times for PT notes can be seen in Table 4. The estimation times for OT notes can be seen in Table 5.

<table>
<thead>
<tr>
<th>Note Type</th>
<th>Estimated Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>10</td>
</tr>
<tr>
<td>New Evaluation Rehab</td>
<td>45</td>
</tr>
<tr>
<td>New Evaluation-Ortho</td>
<td>10</td>
</tr>
<tr>
<td>New Evaluation-Baby</td>
<td>25</td>
</tr>
<tr>
<td>Rehab</td>
<td>15</td>
</tr>
<tr>
<td>Rehab Discharge</td>
<td>30</td>
</tr>
<tr>
<td>Discharge</td>
<td>20</td>
</tr>
</tbody>
</table>
Table 5: Estimation of Time to Complete OT Notes

<table>
<thead>
<tr>
<th>Note Type</th>
<th>Estimated Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>15</td>
</tr>
<tr>
<td>New Evaluation</td>
<td>25</td>
</tr>
<tr>
<td>Discharge</td>
<td>20</td>
</tr>
</tbody>
</table>

5.6.1. Compliance Requirements
One of the reasons that the documentation process is inefficient is that the therapists are unsure of what information is required and therefore include additional information as a precaution. The OTs have discussed this with their compliance department and have attained a list of the required fields for their different reports. However, the PTs are still in the process of discussing this with their compliance department.

In order to streamline the documentation process, the first step would be for the therapists to have a checklist of different items that are required for each individual type of report. This would significantly reduce the time taken to perform documentation.

5.6.2. Templates
The team observed that the use of templates was not standard across the department. Frequently, the templates would have to be modified before they could be used, and it was noted that the modifications were often the same, indicating that there may be a need for the templates to be updated. Through interviews with the therapists, the team has determined that both the OTs and PTs would like to see improvements to their templates both for their patient care reports and home care instructions. This process however would require a fully trained therapist who was familiar with the medical requirements of the reports.

5.7. Examined Inventory Management Process
The team also observed the current state of the equipment processes. Currently, equipment may be found in four rooms, which are all located in the gym area. The team recorded the average time a typical therapist spent in the gym area. With a sample size of 15, the average amount of time a therapist spent in the equipment area was 2 minutes, 18 seconds. It was estimated by the therapists that a clean specific piece of equipment could be found 60% of the time. This means that 40% of the time the therapist was “unsuccessful.” When a therapist could not find a clean specific piece of equipment, it was reported that the therapist would either use sanitizer to disinfect the dirty piece of equipment or choose another piece of equipment that would accomplish a similar purpose. It was estimated by the therapists that a typical day requires about 6 different trips to the equipment. Taking into the consideration that there are 8 inpatient therapists, the team calculated the amount of time per day that could be saved if the unsuccessful trips were eliminated:

\[
\text{minutes/day} = \left( \frac{138 \text{ seconds}}{\text{trip}} \times \frac{6 \text{ trips}}{\text{day}} \right) \times 40\% \times 8 \text{ therapists} = 44 \text{ minutes/day}
\]
The team recognizes that the “unsuccessful” trips could not be completely eliminated. However, an increase in the first time quality metric (currently reported to be about 60%) of the inventory management system would save the therapists time.

5.8. Observed Technician Utilization

The PT/OT Department currently has one technician and 5 volunteers. The technician works on a regular schedule while the volunteers have a more flexible schedule. The team observed that the technician does not have a clearly defined job scope and at times searches for things to do so in order to avoid being idle. Current technician tasks include organizing the volunteers, cleaning the rooms in the gym area, restocking stores as well as performing maintenance checks on equipment like the crash cart and casting machines.

The volunteers of the department are currently uncoordinated and do not have specific job scopes. From the team’s observations, the volunteers could significantly add to the department’s efficiency if they were well organized and coordinated. Volunteer work scheduling is out of the scope of this project, but the team recommends that the department management team further examines this subject.

5.9. Performed Carry-Over Analysis

It was determined that PT has a larger Total PM Census than OT. The average Total PM Census for PT was 47.32 and the average Total PM Census for OT was 34.68 new referral orders. It was noted by the Department Supervisor that the OT Census seemed higher than usual. The increase in the OT Census was speculated to be due to the data including some of the speech therapy patients. The OT census is usually between 20 and 30 patients. Figure 4 shows the Total PM Census for both PT and OT for the month of October.

The team examined whether there was a relationship between the day of the week and the number of awaiting referrals. Considering that the sample size for each day of the week was small (n=4) it was difficult to draw robust conclusions.

Figure 10 shows a box plot of the number of awaiting new referrals (PT), stratified by day of week. The PT therapists seemed to respond to all new referrals by Monday at 3:15 pm for four weeks in a row. The number of awaiting new referrals seemed to increase as the week progressed, with the weekend accounting for the high awaiting new referral levels.
Figure 10 shows a box plot of the number of awaiting new referrals (OT), stratified by day of week. Considering that none of the OT therapists are scheduled to work on the weekends, it is not surprising that there is a large amount of awaiting new referrals on Monday. The low amount of awaiting new referrals on the weekend may have been a result of the doctors knowing that pediatric OT therapists do not come in on the weekend.
5.10. Performed Response Time Analysis

Figure 12 shows the breakdown of PT response times. The therapists were able to meet the 24 hour target in 64% of the 126 cases for the month of October. The mean response time was 30.8 hours while the median was 21.7 hours. The high mean can be attributed to certain wards experiencing long service times due to unavoidable circumstances such as a patient having to recuperate from surgery. Figure 14 presents the overall PT response time in the form of a box plot that shows a front-loaded distribution.

![Figure 12: PT Order Response Time](image)

Sample Size = 126; October 1 - 31 2009; IOE 481

Figure 13 shows the breakdown of OT response times. The therapists were able to meet the 24 hour target in 65% of the 40 cases for the month of October. It must be noted that OT had more than 40 orders, but a significant amount of them were duplicates. 94 orders were placed out of which only 40 were unique. The therapists had a mean response time of 58.9 hours and a median of 23.2 hours. The mean response time was significantly higher than the 24 hours target due to small but significant outliers coupled with the relatively small sample size as illustrated in Figure 15.
Figure 13: OT Order Response Time
Sample Size = 40; October 1 - 31 2009; IOE 481

Figure 14: PT Box plot of Overall Response Time
Sample Size = 126; October 1 - 31 2009; IOE 481
6. Potential Opportunities for Efficiency Improvements
The primary goal of this project was to obtain an end-to-end visibility of the department’s operating model. However, over the course of the analysis, the team has identified two areas that show great potential for an increase in efficiency. Namely, these are the documentation process and the inventory management system which deals with the storage of toys and therapy aids.

6.1. Inventory Management System
The team recommends that a standardized inventory management system be designed to reduce travel and equipment times. In the inventory management system, all the equipment and toys would be specifically labeled and stored in specific locations in equipment area. The team recommends that it is taken into consideration that at certain times the rooms are used by patients, and a therapist may not be able to enter to get a toy. It is also recommended that inside the gym area, there is a specific drop-off point where therapists could drop off their dirty toys. The technician would then be in charge of training volunteer staff in cleaning and restocking the dirty toys for the next therapist to use. With these changes, the therapists would reduce their time looking for toys/equipment, cleaning toys/equipment, and reduce the probability that the specific toy or piece of equipment will not be in stock.

6.2. Documentation Template Standardization
In the current state of the Pediatric PT/OT Department, there is not one person who is in charge of determining what information should be included in the therapist’s notes. The team recommends that before templates are updated, one designated person should be in charge of determining and periodically updating the information that must be included in the notes.

The team recommends that each electronic documentation note has a supplementary hard copy note. The hard copy note would be taken to the patient evaluation and would only contain short, abbreviated notes that would help the therapist when he/she needed to complete the electronic documentation.
For the creation of the templates, the team recommends that the Department invest in a student intern with a Computer Science Engineering background. If the therapists explained to the student intern exactly what they wanted each field to say and how they wanted they wanted to navigate through the document, then the student intern would be able to efficiently create the template without disturbing the work levels of the therapist.

The team also recommends that a standard review process of the templates be scheduled, on a quarterly basis. If the templates could be continually updated, then a situation where every template needed to be re-created could be avoided in the future.

7. Lean Certification Course (Therapists and Technician)

The Director of PT/OT at UH has indicated that 2 inpatient therapists as well as the PT/OT technician will attend a 4 day Lean Certification Course. The team has a few areas that could benefit from internally driven projects and would like to provide the team attending the workshop with some suggested areas to focus on. By discussing these areas before attending the workshop, the team or therapists will be able to identify key points at the workshop that may be especially pertinent to them.

7.1. Therapist Areas of Focus

Documentation has proven to be a significant task. The team of therapists would have to identify ways of streamlining the process while still allowing it to be flexible enough to accommodate minor changes in the future. For example, this need could be met by having a person on staff that is familiar with computer programming so that changes to templates can be made internally. The lean courses will also allow the therapists to identify areas of non-value added work within their documentation processes. With regards to documentation, therapists should strive to meet the following goals:

- Established a standardized list of required items for each type of patient report
- Update templates
- Compile a database of home care instructions

7.2. Technician Areas of Focus

The technician is in charge of all the equipment in the PT/OT area at Mott Hospital. The report has already discussed the inefficiencies with the inventory management system. Through the course the technician will be able to learn more about inventory management and create a system where the equipment is managed efficiently. The technician will be able to define roles for the volunteer workers to help maintain the inventory system. The technician should adopt a focus for his lean improvement work with regards to inventory management to maintain a clean, well-stocked and comprehensive system to provide toys and therapy aids to therapists. This can be done by paying special attention to the 5S system and strive to meet the following goals:
• Establish an inventory system that enables toys and therapy aids to be cleaned, monitored and available when needed by therapists
• Develop a catalogue system for toys and aids such that they can be easily located
• Develop succinct tasks and goals for volunteers to ease the therapists workload
Appendix A: Therapist Status Updates

This appendix shows the two updates that were provided to the inpatient therapists. The therapists asked to have access to the team’s findings, as results became available.

Lean Project Progress Report: October 23rd, 2009

Hello!

We want to take the time to thank all of you for your continual patience and flexibility. It is most appreciated!

On October 1st, the Pediatric Inpatient Physical and Occupational Therapy Department launched a project that would examine the time spent on non-patient care activities. Brendon Weil, a Quality System Lean Coach at UMHS, introduced many lean principles. The team of Industrial and Operations Engineering (IOE) students presented some specific details of the project plans. The contact information for Brendon and the IOE students can be found below:

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brendon Weil</td>
<td><a href="mailto:bweil@umich.edu">bweil@umich.edu</a></td>
<td>Lean Coach</td>
</tr>
<tr>
<td>Joseph Pragas</td>
<td><a href="mailto:pragas@umich.edu">pragas@umich.edu</a></td>
<td>IOE Student</td>
</tr>
<tr>
<td>Kayla Stelter</td>
<td><a href="mailto:kstelter@umich.edu">kstelter@umich.edu</a></td>
<td>IOE Student</td>
</tr>
<tr>
<td>Jack Wang</td>
<td><a href="mailto:wangjack@umich.edu">wangjack@umich.edu</a></td>
<td>IOE Student</td>
</tr>
</tbody>
</table>

Since October 1st, the team IOE students have been shadowing the inpatient Therapists. So far, we have spent 706 minutes with the inpatient Occupational Therapists and 1294 minutes with the inpatient Physical Therapists. Through our observations, we have gathered information about how the therapists spend their days. We will update the charts below, as more data becomes available. Below are the findings:

![OT Time Breakdown Chart]
Future Plans:

We would like to focus on two important components: templates for documentation and frequently used equipment. It would be very helpful if the Inpatient therapists could fill out a quick survey for us. We are asking the Inpatient OT therapists to work together to fill out the “Inpatient OT Survey.” Similarly, we would like the Inpatient Physical Therapists to fill out the “Inpatient PT Survey.” We will collect the forms on October 30th. (And we are sorry in advance for asking you to fill out even more forms)

Once again, thank you very much for your time and patience with us.

Lean Project Progress Report: November 18th 2009

Hello!
We want to take the time to thank all of you for your continual patience and flexibility. It is most appreciated!

On October 1st, the Pediatric Inpatient Physical and Occupational Therapy Department launched a project that would examine the time spent on non-patient care activities. Brendon Weil, a Quality System Lean Coach at UMHS, introduced many lean principles. The team of Industrial and Operations Engineering (IOE) students presented some specific details of the project plans. The contact information for Brendon and the IOE students can be found below:

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<td>Brendon Weil</td>
<td><a href="mailto:bweil@umich.edu">bweil@umich.edu</a></td>
<td>Lean Coach</td>
</tr>
<tr>
<td>Joseph Pragas</td>
<td><a href="mailto:pragas@umich.edu">pragas@umich.edu</a></td>
<td>IOE Student</td>
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<tr>
<td>Kayla Stelter</td>
<td><a href="mailto:kstelter@umich.edu">kstelter@umich.edu</a></td>
<td>IOE Student</td>
</tr>
<tr>
<td>Jack Wang</td>
<td><a href="mailto:wangjack@umich.edu">wangjack@umich.edu</a></td>
<td>IOE Student</td>
</tr>
</tbody>
</table>
1. Key Findings

The percentages presented are based on 706 minutes of observation with the inpatient Occupational Therapists and 1294 minutes with the inpatient Physical Therapists.

These numbers will be compared against the figures from the productivity study which was added on to the billing sheets.

2. Active Engagement

There will be 4 therapists sent for a 4-day Lean workshop in January. The workshop aims to enable the therapists to drive self-initiated projects and improvements within the OT/PT department at Mott.

The project that our team is currently working on will provide the therapists with the necessary data and analysis to support any recommendations or future projects that they would like to propose.

From the team’s perspective, there are a couple of areas that we feel could benefit from further analysis. We would like to further discuss this with the therapists to be able to further focus our efforts. The areas are as follows:

- Toys, therapy aides and inventory management
- Documentation

Should you have any further matters to discuss, the team will be around after the meeting and we would be glad to speak to you. Once again, thank you very much for your time and patience with us.

Sincerely,

Joseph Pragas
Kayla Stelter
Jack Wang
Appendix A

3. Project Timeline

**Initial Analysis (10/23 – 10/30)**
- Status: Completed
  - Created Preliminary Current State Map
  - Analyzed proportions of work

**Staff Interviews (10/5 – 10/7)**
- Status: Completed
  - Received more in-depth feedback
  - Learned what to look for in Observations

**Initial Meeting (10/1)**
- Status: Completed
  - Introduced ourselves
  - Presented project and received feedback

**Billing Sheet Analysis (11/20)**
- Status: Not Started
  - Have not received data set
  - Analyze quantitative data that correlates with observations

**Travel Time Study (11/4 – Pres.)**
- Status: In Progress
  - Gather travel time information
  - Model potential time savings

**Therapist Shadowing (10/12 – 10/23)**
- Status: Completed
  - Observed the daily process for therapists
  - Asked questions about specifics of process

**Carry Over Analysis (11/9 – Pres.)**
- Status: In Progress
  - Analyze data to see if any correlation exists between variables

**Staff Survey (10/30 – 11/14)**
- Status: Completed
  - Received more information on equipment and templates
Appendix B: PT/OT University Hospital Lean Project

This appendix shows the updates that were provided to the inpatient therapists. The therapists asked to have access to the team’s findings, as results became available.

**Time Spent Daily On Tx & Evals**

(Future State-12 Month Plan)

- **Schedule/Documentation**
  - Increase Staffing Volumes on Weekends to Match Demand
  - Impacting: A, B, E

- **Other Processes** (NVA But Necessary)
  - 45%

- **Triage/Travel/Other**

- **Chart Reviews/Rounds**

- **Business Time**

- **Communications/InDept/Handoff**

- **Equipment Gathering**

- **Completing Tx & Evals**
  - 55%
  - Est. 7 Tx/Evals Per day

- **Site Visits To Surveyed Hospitals To Collect Additional Process Benchmark Information**
  - Impacting: A, B, E

- **Pilot Use Of A Non-Therapist “New Referral” Triage Role**
  - Impacting: A, B, E

- **Pilot Use Of Techs In Supporting Role To Therapists**

**Plan:**

- **Kick Off:**
  - (a-b) Nov. (c) Apr. '09
  - a) Get approval for conversion, acquire equip.
  - b) Split existing Patient/Family waiting rooms in 1/3 on 6 b/c & 8 b/c
  - c) Workshop To Create Room Lay-Out – Standardize Across All Satellites
  - Impacting: A, B, C, F

- **Evaluation Opportunity To Open Satellite Therapy Rooms On 6 b/c, 8 b/c**
  - Impacting: B, E, F

- **Documentation Timing/Content/Method Standard Work Impl.**
  - Impacting: A

**Plan:**

- **“Kick Off” Date: (a) November (b) Feb./Mar. ’09**
  - a) Full Implementation - Standardized Short Note Process
  - b) Workshop To Create Standard Work related to Carelink use & Information entry for performance monitoring and to develop "Full Note Outlines" to optimize & standardize documentation in Care Web
  - c) Submit Business Case (FY-10) – Rehab Documentation Software

**Plan:**

- **“Kick Off” Date: October 2008**
  - a) HR support in developing a comprehensive plan that includes "b" - "c" & "d" or other alterations to comp. models & additional strategies to increase existing workforce on weekends in a cost effective manner
  - b) Post & Fill – additional "Weekend Only" Positions (8 or 10 hr.) – Role would be predominately completing new and carry-over referrals. Roughly 3 FTEs for C.T. / 1-5 FTEs for P.T.
  - c) Enlist additional weekend sign-up through existing staff by offering weekend bonuses for each weekend worked (instead of after 5th) or other comp. based weekend incentives (see "c")
  - d) Submission of cost/benefit analysis for the plan to Senior Admins.

**Plan:**

- **“Kick Off” Date: Oct – Dec ’08**
  - **Role/Plan:**
  - a) Collect Information On:
    - Software & Methods For Rehab Documentation
    - How Rehab Techs Are Used To Support Therapists
    - Weekend Coverage Models and Incentives
    - Other Best Practices
  - **Kick Off** Date: Jan. ’09
  - a) Hire a temp for use during pilot
  - b) 7 days per week-Start 1 hour prior to therapists
  - c) Screen/Assists New Referrals, Pages for Urgents, Reviews activity orders, Pages Physicians
  - d) Submit FTE proposal to Senior Leadership

**Role/Plan:**

- **“Kick Off” Date: Jan. ’09**
  - a) Workshop To Create Standard Work – Develop widespread pilot & implementation plan
  - **Kick Off** Date: (a) November (b) Feb./Mar. ’09
  - a) Workshop To Create Standard Work – Possible Pilot In Conjunction With New Triage Role (In Model Area)
  - b) Submit FTE proposal to Senior Leadership
Appendix C: Therapist Interview

This appendix shows some of the questions that were asked during the interview process. It also details the interview schedule.

- When do you do documentation and how long does it take?
- How are you assigned patients?
- Walk me through a typical day.
- How are you scheduled to see patients?
- What problems do you encounter on a day-to-day basis?
- What types of equipment do you use?
- Where do you think most of your time is being consumed?

<table>
<thead>
<tr>
<th>Monday, Oct 5, 2009</th>
<th>Therapist</th>
<th>Department</th>
<th>Team Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>Lori Brinkey</td>
<td>PT: out patient</td>
<td>Kayla</td>
</tr>
<tr>
<td>3:00</td>
<td>Nicholle Gerring</td>
<td>PT: out patient</td>
<td>Joseph</td>
</tr>
<tr>
<td>3:15</td>
<td>Chris Tapley</td>
<td>PT: inpatient</td>
<td>Joseph</td>
</tr>
<tr>
<td>3:30</td>
<td>Dan Santiani</td>
<td>PT: inpatient</td>
<td>Joseph</td>
</tr>
<tr>
<td>3:45</td>
<td>Sarah Mcallister</td>
<td>PT: inpatient</td>
<td>Joseph</td>
</tr>
<tr>
<td>4:00</td>
<td>Donna Thompson</td>
<td>OT: inpatient</td>
<td>Joseph</td>
</tr>
<tr>
<td>4:15</td>
<td>Trish Mozdzierz</td>
<td>OT: inpatient</td>
<td>Joseph</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wednesday, Oct 7, 2009</th>
<th>Therapist</th>
<th>Department</th>
<th>Team Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Shelia</td>
<td>Admin</td>
<td>Kayla</td>
</tr>
<tr>
<td>8:15</td>
<td>Sheery Herman-Hilker</td>
<td>PT: outpatient</td>
<td>Kayla</td>
</tr>
<tr>
<td>8:30</td>
<td>Betsey Howell</td>
<td>PT: outpatient</td>
<td>Kayla</td>
</tr>
<tr>
<td>9:00</td>
<td>Alice Morrison</td>
<td>OT: inpatient</td>
<td>Kayla</td>
</tr>
<tr>
<td>9:15</td>
<td>Stacy Panetta</td>
<td>OT: outpatient</td>
<td>Kayla</td>
</tr>
<tr>
<td>9:30</td>
<td>Lexanne Creitz</td>
<td>Admin</td>
<td>Kayla/Jack</td>
</tr>
<tr>
<td>9:45</td>
<td>Lexanne Creitz</td>
<td>Admin</td>
<td>Kayla/Jack</td>
</tr>
<tr>
<td>10:00</td>
<td>Ezekiel Joubert</td>
<td>Technician</td>
<td>Jack</td>
</tr>
<tr>
<td>10:15</td>
<td>Sisan Duncan</td>
<td>PT: outpatient</td>
<td>Jack</td>
</tr>
</tbody>
</table>
Appendix D: Billing Sheets

This appendix shows the PT and the OT billing sheet. Each day, a therapist is required to record the information and turn the billing sheet in to the Department Clerk by 8 am the following day.
Appendix E: Therapist Surveys
This appendix shows the surveys that were completed by the therapists. The group of inpatient PT therapists received one set of surveys, and the group of inpatient OT therapists received one set of surveys. The therapist were instructed to collaborate and work together to fill out the surveys.

In-Patient PT Survey- Documentation

Please fill out the following sheet with all of the In-Patient PT therapists. We plan on collecting the form on October 30th, 2009. If more time is needed, it can be provided.

- Rehab excel files are too clunky: most time consuming, least information
- Developmental documentation called “Neo-Doc” has high learning curve
  - New developmental templates, preferably with age groups
    - 0 – 1, 1 – 3, 3 – 5
# In-Patient PT Survey - Equipment

<table>
<thead>
<tr>
<th>Frequently Used Equipment/Toy</th>
<th>Types of Therapy Sessions that Use this Equipment/Toy</th>
<th>Desired Quantity of Equipment/Toy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumble Form Seat and Wedges</td>
<td>All Ages</td>
<td>2 of each size</td>
</tr>
<tr>
<td>Rattles/Baby Toys</td>
<td>0 mo – 2 yr</td>
<td>2 – 4 of each toy</td>
</tr>
<tr>
<td>Bikes*</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

*note: To be determined what department should provide bikes*
In-Patient OT Survey- Documentation

- Weekly group meetings with OT therapists to review template future plans
- Goal is to standardize the CareWeb Template so that they’re all on the same page
## In-Patient OT Survey-Equipment

<table>
<thead>
<tr>
<th>Item</th>
<th>Age Group</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bright Colored Rattles</td>
<td>0mo – 12mo</td>
<td>10 -12</td>
</tr>
<tr>
<td>B+D Eval / Peabody Eval</td>
<td>0mo – 5yr</td>
<td>1</td>
</tr>
<tr>
<td>One inch Blocks</td>
<td>6mo +</td>
<td>1 large bag</td>
</tr>
<tr>
<td>Shape Sorter</td>
<td>8mo – 2yr</td>
<td>3</td>
</tr>
<tr>
<td>Sesame St. Pop up Toy</td>
<td>8mo – 2yr</td>
<td>3</td>
</tr>
<tr>
<td>Musical Cause/effect Toy</td>
<td>8mo – 2yr</td>
<td>3</td>
</tr>
<tr>
<td>Bean Bags</td>
<td>12mo +</td>
<td>30</td>
</tr>
<tr>
<td>Playground Ball</td>
<td>12mo +</td>
<td>3</td>
</tr>
<tr>
<td>Bean Ball</td>
<td>12 mo +</td>
<td>5</td>
</tr>
<tr>
<td>Matchbox cars</td>
<td>2yr +</td>
<td>20 – 25</td>
</tr>
<tr>
<td>Play dough/ toys</td>
<td>2yr +</td>
<td>2 baskets full</td>
</tr>
<tr>
<td>Markers/paper/scissors</td>
<td>2yr +</td>
<td>fat and skinny markers, 5 scissors</td>
</tr>
<tr>
<td>Basketball</td>
<td>4yr +</td>
<td>2</td>
</tr>
<tr>
<td>Dynamometer/Pinchometer</td>
<td>4yr +</td>
<td>2</td>
</tr>
<tr>
<td>Goniometer</td>
<td>4yr +</td>
<td>6</td>
</tr>
<tr>
<td>Grooved Peg FM test</td>
<td>4yr +</td>
<td>2</td>
</tr>
<tr>
<td>9 hole peg test</td>
<td>4yr +</td>
<td>1</td>
</tr>
<tr>
<td>Construct. Toys</td>
<td>4yr +</td>
<td>1 large set, multiple small sets</td>
</tr>
<tr>
<td>(legos, marble wars, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoom Ball</td>
<td>5yr +</td>
<td>3</td>
</tr>
<tr>
<td>Games</td>
<td>all ages</td>
<td>many (~10 – 20)</td>
</tr>
<tr>
<td>Puzzles</td>
<td>all ages</td>
<td>20</td>
</tr>
<tr>
<td>Therapy putty</td>
<td>all ages</td>
<td>1 large bucket, all colors</td>
</tr>
<tr>
<td>Therapy bands</td>
<td>all ages</td>
<td>1 box each color</td>
</tr>
<tr>
<td>Digital Camera</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Appendix F: Current State Diagram

This appendix shows the current state diagram that was observed during the process (GEMBA) observations.

- Arrive at Staff Pitt
  - Arrive time varies between 6:30-7:00
  - PTs generally arrive earlier than OTs

- Finish Documentation and Billing Sheet From Day Before
  - Must turn in yesterday’s Billing Sheet to Shelia by 8 am
  - OT Billing Sheets = Blue
  - PT Billing Sheets = Peach

- Schedule and Read Notes for Today
  - Common Goal: See first patient by 8:30
  - Some people use the billing sheet to keep track of completed documentation - Write name on billing sheet during scheduling and write patient registration number after the note is completed
  - Appointments scheduled by Shelia are listed on door (Rehab patients)
  - For students with patients, they must consider which cases would benefit their student, and take time to discuss the cases with their student. Students are typically here for 12 weeks in both PT and OT
  - Typically, the PM&R Dept has 3-5 students/year

- Get Equipment and Travel to First Patient
  - Equipment is usually gathered from the gym or the clean holding closets on the floor
  - Babies usually don’t need much equipment (just bottles) and are usually ready on arrival

- Patient Care Time
  - Mornings are more ideal in most cases, so some therapists give new evals the mornings, others give repeat patients the mornings
  - Some group patients that are located next to each other together, others don’t consider patient locations
  - Some schedule whole day when they arrive, others schedule only morning
  - Some typically schedule an hour for new evaluation and just works until patient is tired
  - Often needs to “show up” at rooms to schedule. Scheduling with the nurses won’t work, nurses will say they’re busy. (nurses protective of their domain?)
  - Nurse shift change happens at 8
  - Therapists need to get the name of the new nurse for their patient
  - Can’t page nurse before 8

- Documentation
  - Documentation is usually completed in pit (and rarely at computers on floors)

<table>
<thead>
<tr>
<th>PT Note Exclusions</th>
<th>Estimated Time (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>10</td>
</tr>
<tr>
<td>New Evaluation</td>
<td>45</td>
</tr>
<tr>
<td>New Evaluation</td>
<td>10</td>
</tr>
<tr>
<td>New Evaluation</td>
<td>25</td>
</tr>
<tr>
<td>Rehab</td>
<td>15</td>
</tr>
<tr>
<td>Discharge</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OT Note Exclusions</th>
<th>Estimated Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>15</td>
</tr>
<tr>
<td>New Evaluation</td>
<td>25</td>
</tr>
<tr>
<td>Discharge</td>
<td>20</td>
</tr>
</tbody>
</table>

- No standardized scheduling method.
- No standardized templates for documentation. Everyone does documentation differently, and there is no feedback on what exactly needs to be in a note.
- No standardized templates for home care instructions. Quality differs from therapist to therapist
- Personalized home care instructions with pictures
- Flips through binder of different exercises – chooses appropriate sheets – photocopies 2 packets – put sheets back into binder
- Type up 1 page word document

- No formalized training for documentation process for new employees

Potential Problem

- “Inventory Room is disorganized”
- Equipment not being clean
- Can’t find nurse
- Patient isn’t in room
- Sometime patient is not ready to be taken down to gym
- Specific toys are sometimes difficult to find

Quote from therapist

"The computers on the floors are never free and are difficult to log into"

Problem: Documentation is usually completed in pit (and rarely at computers on floors)

Appendix F