Recommendations to Improve the UMHS Procedure for Obtaining Missing Materials

Final Report

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Executive Summary

Multiple times a day at the Surgical Intensive Care Unit (SICU) and Pediatric Cardio Thoracic Unit (PCTU) of the University of Michigan Health System (UMHS), the nursing staff needs to obtain missing medical and surgical materials. Obtaining missing materials is non-essential non-value added and carries an associated “soft” cost for the nurses obtaining the material. In order to minimize the number of occurrences of missing materials, the Materiel Services Center (MSC) has decided to transition from their current Just-In-Time materiel management system to a Logical Unit of Measure (LUM) materiel management system. Although LUM costs more to operate, MSC believes it will relieve its investment by minimizing the “soft” cost associated with the nursing staff obtaining missing materials. The purpose of this project was to determine the impact of obtaining missing materials by identifying and quantifying the non-essential non-value added labor. This report documents the methods, findings, conclusions and recommendation.

The primary goal of this project was to provide recommendations to improve the current procedure for obtaining missing material that will:

- Reduce the non-essential non-value added labor of obtaining missing materials.
- Reduce the “soft” cost associated with the nursing staff obtaining missing materials.
- Support the quality of patient care by the nursing staff.

The project scope included the procedure for obtaining missing medical, surgical materials, and supplementary materials in the SICU and the PCTU departments of UMHS. Supplementary materials are materials for individual patients that are only stocked at the bedside for special cases. The procedure for obtaining missing materials included nurses, nurse aides, clerks, technicians, and MSC. The procedure began when a nurse needed a material and discovered that it was missing, and it ended when the material was obtained and brought back to the patient’s bedside.

The project scope excluded the procedure for obtaining missing equipment, medication, and linens, as well as all other procedures performed in the PCTU and SICU of UMHS.

Methodology

The project was performed in two phases: qualitative data collection and analysis, and quantitative data collection and analysis. The qualitative data collection and analysis phase consisted of a literature search, PCTU and SICU observations, nurse surveys, and nurse interviews. The quantitative data collection and analysis phase consisted of a frequency study on the relative number of occurrences of a missing material and a duration study on the amount of time taken to obtain a missing material.

Findings and Analysis

Based on PCTU and SICU observations, the procedure for obtaining missing materials occurred when a material was needed for a patient and was missing from the patient’s bedside stocking cart. The nurse could obtain the missing material from the unit’s clean room, central stocking tote or a neighboring patient bedside stocking cart. If the material was missing from the patient’s bedside stocking cart, as well as the unit’s clean room, the nurse would inform the clerk that the
material is missing, and obtain the material from somewhere else. Once informed of the missing material, the clerk would re-order the materials from MSC.

Based on nurse surveys, 45.5% of nurses in the PCTU believed the time taken to obtain missing materials increased when the nurse does not know where the material is located. In the SICU, 54.5% of nurses believed the time taken to obtain missing materials increased when the nurse was preoccupied with other tasks. Based on nurse interviews, the reasons materials were missing from the patient’s bedside stocking cart was because the patient’s bedside stocking cart was insufficiently stocked and because of high usage of materials on incoming transfer patients from the patient’s bedside stocking cart.

Based on one month of data collected from the frequency study in the PCTU, 28% of the observed 108 materials used were missing from the patient’s bedside stocking cart. In the SICU, 12% of the observed 156 materials used were missing from the patient’s bedside stocking cart. Data from the frequency study was used to develop Pareto charts on the most frequently used and most frequently missing materials.

Based on one month of data collected from the duration study, there were 30 observed occurrences of missing materials in the PCTU and 18 observed occurrences in the SICU. Data from the duration study was used to develop distribution charts on the time taken to obtain missing materials.

**Conclusions**

Based on the findings and analysis, conclusions regarding the reasons materials were missing, the procedure for obtaining missing materials, the frequency of missing materials, and the time taken to obtain missing materials were made.

**Reasons Materials Were Missing**

Based on nurse surveys and interviews, the primary reasons materials are missing from the patient’s bedside stocking cart were:

- The patient’s bedside stocking cart was insufficiently stocked from the previous shift.
- High usage of materials in the patient’s bedside stocking cart.

**Obtaining Missing Materials**

Based on PCTU and SICU observations, as well as nurse surveys and interviews, when a material is missing, the material is obtained by the nurse who is in need. The time taken to obtain a missing material increased when

- The nurse did not know where to obtain the missing material.
- The nurse was busy with other tasks.

**Frequently Missing Materials**

Based on the frequency study and analysis, the most frequently missing materials in the PCTU were syringes, tubes, IV connectors, and gauze. These were also the most frequently used materials in the PCTU. In the SICU, needles and IV connectors were the most frequently
missing materials. The most frequently used materials were gauze, needles, syringes, and IV connectors.

Duration to Obtain Missing Materials
Based on the duration analysis, time taken to obtain missing materials in the PCTU was about 42 seconds. This time assumes the nurse is not rushed, not working with a contact precaution patient and knows where the missing material is located. In the SICU, this time is about 47 seconds. These times increase because of not knowing where the missing material is located, exiting and re-entering contact precaution rooms, and abnormal tasks, such as cleaning reusable soiled materials. Performing one of these non-essential non-value added activities increases the time taken to obtain a missing material 300%. The time taken increases from 42 or 47 seconds to over 2 minutes.

Recommendations
The following recommendations address the conclusions made on the procedure for obtaining missing materials and are meant to complement one another.

- Future PAR level analysis of frequently used and missing materials
- Standardization of Unit Clean Room Using Visual Indicators
- Provide more central stocking totes and locate them closer to contact precaution patients
- Develop standardized material kits for incoming patients
- Visual indicator for patient bedside stocking cart re-stocking

Future PAR Level Analysis of Frequently Used Materials
This recommendation aims to study the frequently used materials in more detail. Although syringes, tubes, and IV connectors are the most frequently used and missing materials in the PCTU and SICU, there are many different types of these materials. Thus, a future study on exactly what materials were used from the patient’s bedside stocking cart will help adjust the PAR level in more detail. Ultimately, this study will eliminate the number of occurrences that these frequently used materials are missing from the patient’s bedside stocking cart.

Standardization of Unit Clean Room Using Visual Indicators
This recommendation aims to reduce the amount of time taken to obtain missing materials by organizing the materials in the unit’s clean room by category. Once the materials are organized by category, the categories will be color coded to allow the nurses to use quick visual indicators to obtain missing materials. Included in this recommendation is a standardized comprehensive list of where all materials are located within every unit’s clean room. At the new Mott Children’s Hospital, there will be multiple clean rooms within the unit, making standardization a necessity.

Central Stocking Totes for Contact Precaution Patients
The next recommendation is to provide central stocking totes, stocked to a higher service level, closer to any patient room that is contact precaution. The time taken to obtain missing materials is 300% longer for rooms that are contact precaution because of the non-value added labor involved with entering and exiting the room. Providing closer central stocking totes that are
stocked to a higher service level can help reduce this time and minimize the “soft” cost associated with obtaining missing materials. To manage the costs of this recommendation, the central stocking tote inventory levels will be subtracted from the unit’s clean room inventory levels.

*Develop Standardized Kits for Incoming Patients*
This recommendation was developed based on observations and interviews with nurses. The team observed that transferred patients, either from another unit or from another hospital, needs all of the old material discarded as waste to be replaced with new ones using the supplies provided by the unit, particularly those materials at the bedside. This activity rapidly depletes the materials at the bedside, making it so that materials are more likely to become missing. Therefore, the team recommends that the hospital units implement a procedure that will create standardized kits based on what the incoming transfer patient needs.

*Visual indicator for patient bedside stocking cart re-stocking*
This recommendation aims to eliminate the occurrences of missing materials in the patient’s bedside stocking cart by preventing the patient’s bedside stocking cart from ever being insufficiently stocked. This will be done by implementing a signal system attached to each drawer of the patient bedside stocking cart. When a stocked level of the material is low, the nurse can use the signal to indicate the material is low. The tech will be able to see the signal and which will be a notification to appropriately restock the material from the drawer of the patient’s bedside stocking cart.
Introduction

Multiple times a day at the Surgical Intensive Care Unit (SICU) and Pediatric Cardio Thoracic Unit (PCTU) of the University of Michigan Health System (UMHS), the nursing staff needs to obtain missing medical and surgical materials. In emergencies and other urgent situations, nurses must obtain these missing materials as quickly as possible. However, there are many different procedures for how the nurses can obtain missing materials, which at times may create non-essential non-value added labor. The labor the nursing staff must perform each time they obtain missing materials has a “soft” cost associated with it and may support a decrease in the quality of patient care. “Soft” cost is the inherent cost associated with performing tasks outside a job description. This “soft” cost is due to paying highly trained nurses to obtain missing materials, instead of providing patient care.

To minimize the amount of missing materials, the Materiel Services Department is implementing a Logical Unit of Measure materiel management system. This new system will deliver materials to UMHS units directly from the supplier, reducing the inventory stored in the warehouse. However, due to the extra work demanded on the supplier, this materiel management system is more expensive than the current system to maintain. Materiel Services believes the increased expenses can be relieved by minimizing the non-essential non-value added labor and ultimately, the “soft” cost associated with nurses obtaining missing materials.

Before Materiel Services implements the Logical Unit of Measure materiel management system, they want to determine this system’s impact. Thus, the purpose for this project was to identify and quantify the non-essential non-value added labor, as well as the associated “soft” cost to determine the impact the new Logical Unit of Measure materiel management system will have on the hospital units, once materials are missing less frequently. The purpose of this report is to document the methods, findings, conclusions and recommendations.

Background

The UMHS carries a large amount and variety of materials in its facility at all times. To continue providing high quality patient care, materials must be readily available when patients need them. However, the PCTU and SICU call the Materiel Services Department on an average of 5 and 8 times per day respectively, due to missing materials. The labor involved with obtaining missing materials is non-essential and non-value added and carries with it “soft” costs.

Thus, Materiel Services has decided to transition from their current Just-In-Time materiel management system to a Logical Unit of Measure materiel management system to minimize the amount of missing materials. The current Just-In-Time system in the warehouse stores materials in large pallets and crates. In the new materiel management system, the supplier forgoes the warehouse and delivers materials in smaller quantities, such as in boxes or even individual items directly to the hospital units. Although this new system costs more to operate, Materiel Services believes it will recover its investment by minimizing the “soft” cost associated with the nursing staff obtaining missing materials.
Goals and Objectives

The primary goal of this project was to provide recommendations to improve the current procedure for obtaining missing material that will:

- Eliminate the non-essential non-value added labor of obtaining missing materials.
- Minimize the “soft” cost associated with the nursing staff obtaining missing materials.
- Support the quality of patient care by the nursing staff.

The objectives of this project were to identify and quantify the non-essential non-value added labor and to document the current procedure related to obtaining missing materials. The current procedure included the missing material, the expected and current location of the missing material, and the hospital employees involved in obtaining the missing material.

Key Issues

The following key issues were the catalyst for this project:

- Materials may not be immediately available to the nurses when patients need them.
- The labor related to the nurses obtaining missing materials is non-essential non-value added labor.
- This non-essential non-value added labor is expensive when performed by nurses and produces an associated “soft” cost.
- This non-essential non-value added labor may support a decrease in the quality of patient care.
- There is no standardized procedure for obtaining missing material.

Project Scope

The project scope included the procedure for obtaining missing medical and surgical materials, as well as supplementary materials in the PCTU and SICU departments of the hospital. Supplementary materials are specialized materials for individual patients that are only stocked at the bedside for special cases. The procedure for obtaining missing materials included nurses, nurse aides, clerks, technicians, and the Materiel Services Department. The procedure began when a nurse needed a material and discovered that it was missing, and it ended when the material was obtained and brought back to the patient’s bedside stocking cart.

Any task that does not involve obtaining missing materials for the employees of the PCTU and SICU was excluded from the scope of this project. Materials that were excluded from the scope of the project were linen, equipment, and medicine because these items were not included in the new materiel management system. The project focus was to collect data on the nursing staff as it related to the non-essential non-value added task of obtain missing materials. The final goal was to make recommendations improve the procedure for obtaining missing materials.
Qualitative Data Collection Phase

The data preparation and data collection phases documented in the proposal and interim report developed into qualitative and quantitative data collection. The purpose of the qualitative data collection phase was to develop an understanding of the current procedure for obtaining missing materials. Four tasks were performed within this phase:

- Literature search
- SICU and PCTU initial observations
- Nurse surveys
- Nurse interviews

**Literature Search**

The literature search was performed from January 19, 2009 to February 2, 2009. Additional literature searches were later conducted as a reference. The literature obtained during the literature search was used to gain an understanding of the Logical Unit of Measure materiel management system within health systems. This literature explained the principles of Logical Unit of Measure, as well as the possible impacts it may have on a hospital. Literature was collected from healthcare materiel management journals from across the country. One article titled, “The Impact of Operational Failures on Hospital Nurses and their Patients”, written by Anita L. Tucker suggested that operational failure such as obtaining materials missing from the patient’s bedside stocking cart, “on average, caused patients some discomfort or inconvenience, but usually did not pose a major safety risk to patients.”

**SICU and PCTU Initial Observations**

The SICU and PCTU initial observations were completed February 7, 2009 and February 8, 2009. Each member of the project team spent 3 hours in each unit for a total of 18 hours of observations. The purpose of these observations was to obtain an initial understanding of how the unit functions with respect to materials. Team members observed the procedure for obtaining missing materials and asked questions to form a fundamental knowledge. During these initial observations, team members shadowed nurses, techs, and clerks to understand the respective roles involved with obtaining missing materials. Figures 1, 2 and 3 display the patient’s bedside stocking cart, the unit’s clean room, and the central stocking tote in the PCTU and SICU. Patient bedside stocking carts are located within every patient bedroom. Central stocking totes are intermediate material stocking units located in the hallway throughout the unit. Hospital floor plans for both the PCTU and the SICU can be seen as Figure A-1 in the Appendix, which document the location of the PCTU and SICU clean room.
Figure 1: Photographs of the patient’s bedside stocking unit in the PCTU (left) and SICU (right)

Figure 2: Photographs of the PCTU clean room (left) and SICU clean room (right)

Figure 3: Photographs of the central stocking totes in the PCTU (left) and SICU (right)

Findings
The procedure to obtain missing materials can be seen as Figure 4 on the following page:
Figure 4: Flow chart of the process to obtain missing materials in the PCTU and SICU
The procedure above for obtaining missing materials was never observed in its entirety during quantitative data collection, but based on qualitative data collection does occur. The procedure was never observed in its entirety for a few reasons.

- Since the team was only collecting data from one nurse at a time, this procedure may have occurred for a nurse that was not being observed.
- This procedure also may have occurred during a time that data were not being collected.
- The tech is responsible to tell the clerk what to reorder from the Materiel Services Department, so material missing from a patient’s bedside stocking cart may have never coincided with the same material missing from the unit’s clean room.

**Nurse Surveys**
Surveys were developed and distributed in the PCTU and SICU to understand how nurses respond to missing materials and to understand the concerns of the nurses regarding missing materials. The team distributed electronic and hard copy surveys to the nursing staffs of the PCTU and SICU from March 9, 2009 to March 30, 2009. The team collected 40 surveys, 16 from the PCTU and 24 from the SICU. Based on the number of registered nurses employed at each unit, the team received a 17.8% response rate from the PCTU, and a 40% response rate from the SICU. The results of the surveys showed that there were similarities and differences between the two units.

**Findings**
Table 1 and Table 2 represent the similarities and differences between the two units, respectively.

**Table 1: Similar responses from the nursing staff of the PCTU and SICU**

<table>
<thead>
<tr>
<th>Survey Statement</th>
<th>PCTU Nurse Response</th>
<th>SICU Nurse Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. UMHS would be more efficient without missing materials.</td>
<td>98%</td>
<td>98%</td>
</tr>
<tr>
<td>2. It takes at most 5 minutes to obtain a missing material.</td>
<td>85.7%</td>
<td>86.3%</td>
</tr>
<tr>
<td>3. Missing material is due to material usage</td>
<td>81.3%</td>
<td>77.8%</td>
</tr>
<tr>
<td>4. If a material is missing, I find it for myself</td>
<td>87.5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Table 2: Different responses from the nursing staff of the PCTU and SICU**

<table>
<thead>
<tr>
<th>Survey Statement</th>
<th>PCTU Nurse Response</th>
<th>SICU Nurse Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It took time to obtain a missing material because I did not know where it was</td>
<td>45.5%</td>
<td>9.1%</td>
</tr>
<tr>
<td>2. It took time to obtain a missing material because I had too many other task</td>
<td>36.4%</td>
<td>54.5%</td>
</tr>
</tbody>
</table>
A complete table of the responses to the surveys for the SICU and PCTU can be seen in the appendix as Figure A-5 and Figure A-6, respectively.

**Nurse Interviews**
The nurses were interviewed to understand the effect of the experience level of the nurse in obtaining missing materials and to receive the nurses’ insight on obtaining missing materials. Four nurse interviews and one tech interview were performed from March 16, 2009 to March 30, 2009. The interview questions can be seen as Figure A-2 in the Appendix.

**Findings**
The experience level of the nurse ranged from less than 1 year to more than 22 years in the same unit. The team found that a nurse who did not have as much experience may not be as quick obtaining missing materials because of unfamiliarity with the unit or with the material.

One significant response to the question, what is the worst case for obtaining missing materials was, “I guess it’s when you’re in isolation, you have a really sick patient, and you have to take your gown off, take your gloves off, wash your hands, go look for the item, come with a handful, bring as much stuff as you can. Gown up, glove up, go back in the room, only to realize you’re missing something else.”

Another significant response to an interview question on what materials are used most frequently, a nurse said that they may need to, “use up to twenty syringes for a single patient.” However, the bedside supply contains only 4 syringes at a time.

**Quantitative Data Collection Phase**
The data collection phase consisted of two studies to identify and quantify the non-essential non-value added labor involved with obtaining missing materials.

- Frequency study
- Duration study

**Frequency Study**
The frequency study collected data on the number of times materials were missing. Points of interest related to the frequency study include the total number of materials used, the total number of materials that were missing, and the total number of trips made to obtain missing materials. Over 100 hours of data were collected from February 27, 2009 to March 30, 2009. Data were collected in two to three hours intervals, and was randomly collected on Monday through Saturday in the morning, afternoon, and evening.

Each team member was randomly assigned to a specific patient bedside stocking cart by the Charge Nurse at the beginning of the data collection period. Every time the nurse used a material from the bedside stocking cart, the material name, item number and a tally denoting the material was found at the bedside stocking cart was recorded. If multiple materials were used by a nurse during a single trip to the bedside stocking cart, all of the materials used were denoted, but only one tally was denoted. When a nurse would go to the patient bedside stocking cart to
use a material and the material was missing, the material name, item number and a tally denoting the material was not found where it was supposed to be was recorded. The data collection was only observed at one patient bedside stocking cart at a time to enable extrapolation of the data during the data analysis phase. This frequency study provided data on how often materials are missing in terms of number of trips to the bedside stocking cart and total number of items used.

Findings
Based on one month of data collected from the frequency study, 108 materials were needed from the bedside stocking carts in the PCTU. Of those 108 materials, 30 of them were missing from the bedside stocking cart, forcing the nurse to leave the patient to obtain the missing material elsewhere. Thus, 28% of the time a material was needed from the patient’s bedside stocking cart, the material was missing and the nurse was forced to obtain the material elsewhere.

In the SICU, 156 materials were needed from the bedside stocking carts. Of those 156 materials, 18 of them were missing from the bedside stocking cart, forcing the nurse to leave the patient to obtain the missing material elsewhere. Thus, 12% of the time a material was needed from the patient’s bedside stocking cart, the material was missing and the nurse was forced to obtain the material elsewhere.

There are differences between the PCTU and the SICU in terms of the particular unit’s materiel management. The patient’s bedside stocking carts used in the PCTU are drawers that are organized by similar materials in each drawer. The bedside stocking carts used in the SICU are bins that stock a significantly less amount of materials. These bins stock less because of an increased number of contact precaution patients in the SICU. When contact precaution patients leave the unit, all the materials in the bedside stocking carts need to be discarded. As a result, the SICU does not stock the bedside stocking carts as frequently to avoid being wasteful. To prevent some of this waste, the SICU implemented a central stocking tote, which has materials available directly outside patient rooms. These central stocking totes prevent a trip to the unit’s clean room to obtain a missing material.

Duration Study
The duration study collected data on the amount of time taken to obtain a missing material, once it was discovered missing. Points of interest related to the duration study include the amount of time taken to find the missing material, the location where the missing material was found, and the pace of the person who was obtaining the missing material. Over 100 hours of data were collected from February 27, 2009 to March 30, 2009. Data were collected in two to three hours intervals, and was randomly collected on Monday through Saturday in the morning, afternoon, and evening.

Each team member was randomly assigned to a specific bedside stocking cart by the Charge Nurse at the beginning of the data collection period. When a nurse would go to the bedside stocking cart to use a material and the material was missing, the material name, item number and location where it was not found to be was recorded. The amount of time it took to find the missing material was recorded as was the location where the missing material was found.
The pace rating was used as a method to normalize the amount of time it took different nurses to find a missing material. Normal pace was 100%. If a nurse had a slower pace when obtaining the missing material, a pace rating of below 100% would be recorded for that data point. If a nurse had a faster pace when obtaining the missing material, a pace rating of above 100% would be recorded for that data point. As a guideline, the team did not use a pace rating below 85% or above 115%.

Since the pace rating is a subjective data point, each member of the team compared pace ratings with one another to keep the results as consistent as possible from team member to team member. Once the pace ratings were assessed, they were multiplied by the time it took to obtain the missing material. Multiplying the duration times the pace rating yielded the normal time. Thus, if it took a nurse one minute to obtain a missing material and their pace was 90% of the normal pace, a normal paced person would take 0.9 minutes to obtain the missing material.

Findings
The duration study examined occurrences of when materials were missing from the patient’s bedside stocking cart, 30 occurrences were in the PCTU and 18 occurrences were in the SICU. In both units, the amount of time taken to obtain a missing material ranged from 10 seconds to over 2.5 minutes.

Data Analysis Phase
The data from the frequency study and duration study was analyzed. Four analyses were conducted:

1. Observation analysis
2. Nurse survey and interview analysis
3. Frequency analysis
4. Duration analysis

Observation Analysis
Based on PCTU and SICU initial observations, nurse surveys and nurse interviews, two reasons were determined for the amount of missing materials from the patient’s bedside stocking cart, or unit’s clean room.

- Insufficient stocking from previous shifts
- Discarding of materials
- High usage of materials

Insufficient Stocking from Previous Shifts
The patient’s bedside stocking carts are restocked by the tech at the end of every shift. When the tech working is not the usual tech for a particular unit, a chance exists that the bedside stocking carts, as well as the unit’s clean room, will be under stocked for the following shift. Based on the initial observations, the most active periods of the day for material usage are in the morning until 11:00 AM and in the afternoon from 2:00 to 4:00 PM. Thus, a replacement tech working the
night shift, which ends at 7:00 AM, may leave the unit under stocked for one of the busiest times of the day.

**Discarding of Materials**
A unique balance occurs between the amounts of materials that are stocked at the patient’s bedside. Many times in both units, all of the medical and surgical materials need to be thrown away as a preventative measure against the spread of infection. It is possible that multiple times a day, all of these materials could be thrown away and replaced. Discarding materials multiple times a day is a necessary waste for the units. Materials are thrown away when:

- Patients are transferred from other hospitals
- Patients are coming from surgery
- Contact precaution patients leave the unit

**High Usage of Materials**
When patients are transferred from other hospitals to UMHS, or are coming back to a unit in UMHS surgery, all materials that are attached to the patient must be discarded and replaced with materials from the unit. This high usage of materials depletes the patient’s bedside stocking carts and may increase the occurrence of missing materials.

**Nurse Survey and Interview Analysis**
Based on the nurse surveys, obtaining missing materials will at most take five minutes for the nurse to do for themselves. Whether extra time to obtain the missing material is taken because the nurse is unsure where to obtain it, or because the nurse has other tasks to do first, the non-essential, non-value added labor to obtain the missing material exists either way.

Based on the nurse interviews, the nurse can determine where to go to find the material, depending on the urgency of the situation. If an urgent situation occurs while a nurse is missing a material, the nurse can obtain the missing material from a neighboring bedside stocking cart. Otherwise, the nurse can obtain the missing material from the unit’s clean room, or the central stocking tote. Obtaining missing materials from neighboring bedside stocking carts increases the chance of the occurrence of a missing material in the neighboring bedside cart.

**Frequency Analysis**
Pareto charts were developed to understand which materials were used most frequently and to understand which materials were missing most frequently for both the PCTU and the SICU. The materials were grouped together into a more generic category. For example, there are multiple types of syringes that were used and were missing during the team’s observations. Thus, all of the different syringes were grouped together to display how often any syringe was missing from the patient’s bedside stocking cart.
Figure 5: Pareto chart of the most frequently used (blue) and missing (red) materials in the PCTU
Sample Size = 108, Collected February 27, 2009 to March 30, 2009

Figure 6: Pareto chart of the most frequently used (blue) and missing (red) materials in the SICU
Sample Size = 156, Collected February 27, 2009 to March 30, 2009
**Duration Analysis**

As previously mentioned, many of the patients in the SICU are contact precaution patients, which affected the duration of time taken for nurses to obtain missing material due to the extra activities involved with entering and exiting a contact precaution room. Once a nurse observes that a material is missing, the nurse must take off their gown and gloves and wash their hands before exiting the room to begin obtaining the missing material. Once the material has been obtained, the nurse must then put on a new gown and gloves before re-entering the patient’s room. Four data points from the duration study of obtaining missing materials took longer than all of the other data points. These data points were specifically the result of three non-value added reasons:

- Not knowing where to obtain the missing material
- Cleaning and reusing a soiled material
- Exiting and re-entering a contact precaution patient bedroom.

![Time Taken to Obtain Missing Materials](image)

Figure 7: Distribution of the time taken to obtain missing materials in the PCTU
*Sample Size = 30, Collected February 27, 2009 to March 30, 2009*
Figure 8: Distribution of the time taken to obtain missing materials in the SICU
*Sample Size = 18, Collected February 27, 2009 to March 30, 2009*

**Conclusions**

Based on the findings and analysis, conclusions regarding the reasons materials were missing, the procedure for obtaining missing materials, the frequency of missing materials, and the time taken to obtain missing materials were made.

**Reasons Materials Were Missing**

Based on nurse surveys and interviews, the primary reasons materials are missing from the patient’s bedside stocking cart were:

- The patient’s bedside stocking cart was insufficiently stocked from the previous shift.
- High usage of materials in the patient’s bedside stocking cart.

**Obtaining Missing Materials**

Based on PCTU and SICU observations, as well as nurse surveys and interviews, when a material is missing, the material is obtained by the nurse who is in need. The time taken to obtain a missing material increased when:

- The nurse did not know where to obtain the missing material.
- The nurse was busy with other tasks.

**Frequently Missing Materials**

Based on the frequency study and analysis, the most frequently missing materials and the most frequently used materials in both the PCTU and the SICU were:

- Syringes
- Tubes
- IV connectors
- Needles
- Gauze pads

**Duration to Obtain Missing Materials**

Based on the duration analysis, time taken to obtain missing materials in the PCTU was about 42 seconds. This time assumes the nurse is not rushed, not working with a contact precaution patient and knows where to the missing material is located. In the SICU, this time is about 47 seconds. These times increase because of not knowing where the missing material is located, exiting and re-entering contact precaution rooms, and abnormal tasks, such as cleaning reusable soiled materials. Performing one of these non-essential non-value added activities increases the time taken to obtain a missing material 300%. The time taken increases from 42 seconds to over 2 minutes.

**Recommendations**

The following recommendations address the conclusions made on the procedure for obtaining missing materials and are meant to complement one another. The project team suggests that all five recommendations be implemented together to enhance the overall effectiveness.

- Future PAR level analysis of frequently used and missing materials
- Standardization of Unit Clean Room Using Visual Indicators
- Provide more central stocking totes and locate them closer to contact precaution patients
- Develop standardized material kits for incoming patients
- Visual indicator for patient bedside stocking cart re-stocking

**Future PAR Level Analysis of Frequently Used Materials**

The recommendation for a more detailed PAR level analysis of the patient’s bedside stocking cart most frequently used and missing materials aims to eliminate the number of occurrences that these materials are missing. Although syringes, tubes, IV connectors, needles and gauze pads are the most frequently used and missing materials in the PCTU and SICU, there are many different types of these materials. Thus, a future study on exactly what materials were used from the patient’s bedside stocking cart will help adjust the PAR level to an appropriate level to eliminate the occurrences of these missing materials.

**Standardization of Unit Clean Room Using Visual Indicators**

The recommendation for a standardized unit clean room using visual indicators aims to reduce the amount of time taken to obtain missing materials by organizing the materials in the unit’s clean room by category. The categories will be color coded to allow the nurses to use quick visual indicators to obtain missing materials. Included in this recommendation is a standardized comprehensive list of where all materials are located within every unit’s clean room to help train the nursing staff where missing are located. At the new Mott Children’s Hospital, there will be multiple clean rooms within the unit, making standardization a necessity.
**Central Stocking Totes for Contact Precaution Patients**

The recommendation to provide central stocking totes closer to any patient room that is contact precaution aims to minimize the amount of time taken to obtain missing materials due to the procedure for exiting and re-entering the contact precaution patient’s bedroom. The time taken to obtain missing materials is 300% longer for rooms that are contact precaution because of the labor involved with entering and exiting the room. To manage the costs of this recommendation, the central stocking tote inventory levels will be subtracted from the unit’s clean room inventory levels.

**Develop Standardized Kits for Incoming Patients**

The recommendation to develop standardized kits for incoming transfer patients aims to prevent the high usage of materials from the patient’s bedside stocking cart from depleting the cart before the next restocking period. Observations were made that transferred patients, either from another unit or from another hospital, needs all of the old material discarded as waste to be replaced with new ones using the supplies provided by the unit, particularly those materials at the bedside.

**Visual indicator for patient bedside stocking cart re-stocking**

The recommendation to implement visual indicators on the patient’s bedside stocking cart aims to prevent the patient’s bedside stocking cart from ever being insufficiently stocked. The signal system will be attached to each drawer of the patient bedside stocking cart. When a stocked level of the material is low, the nurse can use the signal to indicate the material is low. The tech will be able to see the signal and which will be a notification to appropriately restock the material from the drawer of the patient’s bedside stocking cart.

**Expected Impact**

The data in this report can be used as a supplemental for baseline data for future studies on obtaining missing materials. This report will be used to understand the impact of what happens when a material is missing from the patient’s bedside stocking cart, or the unit’s clean room once the Logical Unit of Measure materiel management system is implemented. This report identifies and quantifies non-essential non-value added labor, which can be used to further improve the procedure for obtaining missing materials. The recommendations made in this report can contribute to improving the procedure for obtaining missing materials in UMHS by identifying and consequentially eliminating the inherent non-essential non-value added labor. By eliminating some of the non-essential non-value added labor involved with obtaining missing materials, the “soft” cost associated with nurses obtaining missing materials will also be reduced. The overall impact that improving the procedure for obtaining missing materials will have on UMHS will be to support the quality of patient care provided by the nursing staff at UMHS.
Appendix

Figure A-1: Floor plan of the PCTU (top) and SICU (bottom)
Source: Obtained from Project Coordinator

GRAPHIC SCALE

0  20'  40'  80'

1/40" = 1'-0"

Clean room
Figure A-2: List of interview questions used during qualitative data collection phase

1. Could you tell us about your experience and history in nursing?

2. Have you ever worked in another healthcare facility, and if so, what was the procedure for obtaining missing materials there?

3. What is the reason why materials become missing?
   a. Is there more than one reason?
   b. If so, what is the main reason?

4. Do you ever notice any materials that are repeatedly missing from the bedside supplies on your unit?

5. What are those common materials (if known) from question 3?

6. What was the worst case in your experience of being interrupted from patient care due to a missing material?

7. How was that experience in question 5 resolved?

8. Give a specific example of a time when you knew you did a good job as a nurse when materials were missing.

9. Do you usually rush to go find the missing material that is needed?
   a. If yes, by how much?
   b. If no, why not?

10. Is it worth your time to try to prevent materials from being missing?

11. How would you do this (question 9)?

12. Do you personally “restock” the bedside often? If so, how often?

Goals of the interview

- Learn about the experience of nurses
- Cite specific examples on final report to back up and reinforce quantitative data
- Learn more about the system and activities
Figure A-3: Control chart of the number of orders per day to the Materiel Services Department from SICU
Sample Size = 238, Source: Materiel Services Department from Feb. 1 to Feb. 28

Figure A-4: Control chart of the number of orders per day to the Materiel Services Department from PCTU
Sample Size = 214, Source: Materiel Services Department from Feb. 1 to Feb. 28
Figure A-5: Nurse survey data from SICU
Sample Size = 24, Collected from Materiel Services Department from Mar. 9 to Mar. 30

1. In my experience, Med-Surg materials are usually missing from:

<table>
<thead>
<tr>
<th>Material</th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply</td>
<td>0.0%</td>
<td>4.3%</td>
<td>30.4%</td>
<td>39.1%</td>
<td>21.7%</td>
<td>4.3%</td>
<td>23</td>
</tr>
<tr>
<td>The extra supplies plastic drawer</td>
<td>20.0%</td>
<td>26.7%</td>
<td>40.0%</td>
<td>13.3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>15</td>
</tr>
<tr>
<td>The central stocking supply</td>
<td>5.3%</td>
<td>31.6%</td>
<td>47.4%</td>
<td>10.5%</td>
<td>5.3%</td>
<td>0.0%</td>
<td>19</td>
</tr>
<tr>
<td>The clean holding room</td>
<td>13.3%</td>
<td>40.0%</td>
<td>33.3%</td>
<td>13.3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>15</td>
</tr>
<tr>
<td>The equipment room</td>
<td>13.6%</td>
<td>31.8%</td>
<td>40.9%</td>
<td>13.6%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>22</td>
</tr>
</tbody>
</table>

2. In my opinion, Med-Surg materials become missing due to:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necessity</td>
<td>0.0%</td>
<td>0.0%</td>
<td>16.7%</td>
<td>27.8%</td>
<td>50.0%</td>
<td>5.6%</td>
<td>18</td>
</tr>
<tr>
<td>Infrequency of stocking</td>
<td>4.8%</td>
<td>9.5%</td>
<td>33.3%</td>
<td>38.1%</td>
<td>9.5%</td>
<td>9.5%</td>
<td>21</td>
</tr>
<tr>
<td>Lateness of stocking</td>
<td>0.0%</td>
<td>12.5%</td>
<td>43.8%</td>
<td>31.3%</td>
<td>12.5%</td>
<td>0.0%</td>
<td>16</td>
</tr>
<tr>
<td>Unavailability</td>
<td>16.7%</td>
<td>50.0%</td>
<td>22.2%</td>
<td>11.1%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>18</td>
</tr>
</tbody>
</table>

3. If the Med-Surg materials were not where they are supposed to be, they were found by:

<table>
<thead>
<tr>
<th>Method</th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looking in another bedside supply</td>
<td>0.0%</td>
<td>12.5%</td>
<td>43.8%</td>
<td>18.8%</td>
<td>25.0%</td>
<td>0.0%</td>
<td>16</td>
</tr>
<tr>
<td>Looking in extra supplies plastic drawer</td>
<td>0.0%</td>
<td>23.1%</td>
<td>53.8%</td>
<td>0.0%</td>
<td>23.1%</td>
<td>0.0%</td>
<td>13</td>
</tr>
<tr>
<td>Looking in the central stocking supply</td>
<td>0.0%</td>
<td>6.3%</td>
<td>31.3%</td>
<td>31.3%</td>
<td>31.3%</td>
<td>0.0%</td>
<td>16</td>
</tr>
<tr>
<td>Looking in the clean holding room</td>
<td>0.0%</td>
<td>6.3%</td>
<td>25.0%</td>
<td>25.0%</td>
<td>37.5%</td>
<td>6.3%</td>
<td>16</td>
</tr>
<tr>
<td>Looking in the equipment room</td>
<td>6.3%</td>
<td>6.3%</td>
<td>31.3%</td>
<td>31.3%</td>
<td>31.3%</td>
<td>0.0%</td>
<td>16</td>
</tr>
<tr>
<td>Asking the clerk to order the item</td>
<td>5.0%</td>
<td>15.0%</td>
<td>40.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>0.0%</td>
<td>20</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

4. If a Med-Surg material is missing:

<table>
<thead>
<tr>
<th>Situation</th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have to find it myself.</td>
<td>0.0%</td>
<td>0.0%</td>
<td>17.4%</td>
<td>21.7%</td>
<td>39.1%</td>
<td>21.7%</td>
<td>23</td>
</tr>
<tr>
<td>I have to ask another person to find it.</td>
<td>8.7%</td>
<td>4.3%</td>
<td>34.8%</td>
<td>34.8%</td>
<td>17.4%</td>
<td>0.0%</td>
<td>23</td>
</tr>
</tbody>
</table>

answered question 24
skipped question 0
answered question 23
skipped question 1
answered specify 23
skipped question 1
answered question 23
skipped question 1
5. What is the approximate time it takes to find the missing materials if they are missing from:

<table>
<thead>
<tr>
<th></th>
<th>Less than 1 minute</th>
<th>Between 1 and 5 minutes</th>
<th>Between 5 and 10 minutes</th>
<th>More than 10 minutes</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply?</td>
<td>13.6% (3)</td>
<td>72.7% (16)</td>
<td>13.6% (3)</td>
<td>0.0% (0)</td>
<td>22</td>
</tr>
<tr>
<td>The extra supplies plastic drawer?</td>
<td>9.1% (2)</td>
<td>81.8% (18)</td>
<td>9.1% (2)</td>
<td>0.0% (0)</td>
<td>22</td>
</tr>
<tr>
<td>The central stocking supply?</td>
<td>0.0% (0)</td>
<td>50.0% (11)</td>
<td>22.7% (5)</td>
<td>27.3% (6)</td>
<td>22</td>
</tr>
<tr>
<td>The clean holding room?</td>
<td>0.0% (0)</td>
<td>47.6% (10)</td>
<td>19.0% (4)</td>
<td>33.3% (7)</td>
<td>21</td>
</tr>
<tr>
<td>The equipment room?</td>
<td>0.0% (0)</td>
<td>38.1% (8)</td>
<td>33.3% (7)</td>
<td>28.6% (6)</td>
<td>21</td>
</tr>
</tbody>
</table>

6. If it takes longer than 1 minute but less than 5 minutes to find missing materials, the reason is mainly because:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are communication delays.</td>
<td>9.10%</td>
<td>2</td>
</tr>
<tr>
<td>The walking distance is long.</td>
<td>27.30%</td>
<td>6</td>
</tr>
<tr>
<td>There are too many tasks.</td>
<td>54.50%</td>
<td>12</td>
</tr>
<tr>
<td>I did not know exactly where it was.</td>
<td>9.10%</td>
<td>2</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. If it takes longer than 5 minutes to find missing materials, the reason is mainly because:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are communication delays.</td>
<td>5.60%</td>
<td>1</td>
</tr>
<tr>
<td>The walking distance is long.</td>
<td>5.60%</td>
<td>1</td>
</tr>
<tr>
<td>There are too many tasks.</td>
<td>61.10%</td>
<td>11</td>
</tr>
<tr>
<td>I did not know exactly where it was.</td>
<td>27.80%</td>
<td>5</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

8. The quality of patient care is reduced when materials are missing from:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply</td>
<td>0.0%</td>
<td>4.5%</td>
<td>40.9%</td>
<td>27.3%</td>
<td>27.3%</td>
<td>0.0%</td>
<td>22</td>
</tr>
<tr>
<td>The extra supplies plastic drawer?</td>
<td>4.5%</td>
<td>27.3%</td>
<td>36.4%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>4.5%</td>
<td>22</td>
</tr>
<tr>
<td>The central stocking supply?</td>
<td>4.5%</td>
<td>9.1%</td>
<td>45.4%</td>
<td>18.2%</td>
<td>18.2%</td>
<td>4.5%</td>
<td>22</td>
</tr>
<tr>
<td>The clean holding room</td>
<td>0.0%</td>
<td>4.8%</td>
<td>57.1%</td>
<td>19.0%</td>
<td>14.3%</td>
<td>4.8%</td>
<td>21</td>
</tr>
<tr>
<td>The equipment room</td>
<td>0.0%</td>
<td>9.5%</td>
<td>47.0%</td>
<td>23.8%</td>
<td>9.5%</td>
<td>9.5%</td>
<td>21</td>
</tr>
</tbody>
</table>

answered question 22
skipped question 2

answered question 18
skipped question 6
9. UMHS would be much more efficient if there are no missing Med-Surg materials from:

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Maybe</th>
<th>Yes</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply</td>
<td>0.0% (0)</td>
<td>13.6% (3)</td>
<td>86.4% (19)</td>
<td>22</td>
</tr>
<tr>
<td>The extra supplies plastic drawer</td>
<td>4.5% (1)</td>
<td>27.3% (6)</td>
<td>68.2% (15)</td>
<td>22</td>
</tr>
<tr>
<td>The central stocking supply</td>
<td>4.5% (1)</td>
<td>22.7% (5)</td>
<td>72.7% (16)</td>
<td>22</td>
</tr>
<tr>
<td>The clean holding room</td>
<td>0.0% (0)</td>
<td>23.8% (5)</td>
<td>76.2% (16)</td>
<td>21</td>
</tr>
<tr>
<td>The equipment room</td>
<td>0.0% (0)</td>
<td>33.3% (7)</td>
<td>66.7% (14)</td>
<td>21</td>
</tr>
</tbody>
</table>

answered question | 22
skipped question | 2
**Figure A-6: Nurse survey data from PCTU**  
*Sample Size = 16, Collected from Materiel Services Department from Mar. 9 to Mar. 30*  

1. In my experience, Med-Surg materials are usually missing from:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply</td>
<td>0.0% (0)</td>
<td>18.8% (3)</td>
<td>25.0% (4)</td>
<td>31.3% (5)</td>
<td>25.0% (4)</td>
<td>0.0% (0)</td>
<td>16</td>
</tr>
<tr>
<td>The clean holding room</td>
<td>0.0% (0)</td>
<td>30.8% (4)</td>
<td>61.5% (8)</td>
<td>0.0% (0)</td>
<td>7.7% (1)</td>
<td>0.0% (0)</td>
<td>13</td>
</tr>
<tr>
<td>The equipment room</td>
<td>0.0% (0)</td>
<td>21.4% (3)</td>
<td>64.3% (9)</td>
<td>7.1% (1)</td>
<td>7.1% (1)</td>
<td>0.0% (0)</td>
<td>14</td>
</tr>
</tbody>
</table>

2. In my opinion, Med-Surg materials become missing due to:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necessity</td>
<td>0.0% (0)</td>
<td>6.3% (1)</td>
<td>12.5% (2)</td>
<td>56.3% (9)</td>
<td>25.0% (4)</td>
<td>0.0% (0)</td>
<td>16</td>
</tr>
<tr>
<td>Infrequency of stocking</td>
<td>0.0% (0)</td>
<td>25.0% (4)</td>
<td>43.8% (7)</td>
<td>18.8% (3)</td>
<td>12.5% (2)</td>
<td>0.0% (0)</td>
<td>16</td>
</tr>
<tr>
<td>Lateness of stocking</td>
<td>0.0% (0)</td>
<td>42.9% (6)</td>
<td>42.9% (6)</td>
<td>7.1% (1)</td>
<td>7.1% (1)</td>
<td>0.0% (0)</td>
<td>14</td>
</tr>
<tr>
<td>Unavailability</td>
<td>0.0% (0)</td>
<td>62.5% (10)</td>
<td>18.8% (3)</td>
<td>18.8% (3)</td>
<td>0.0% (0)</td>
<td>0.0% (0)</td>
<td>16</td>
</tr>
</tbody>
</table>

3. If the Med-Surg materials were not where they are supposed to be, they were found by:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looking in another bedside supply</td>
<td>0.0% (0)</td>
<td>0.0% (0)</td>
<td>26.7% (4)</td>
<td>26.7% (4)</td>
<td>46.7% (7)</td>
<td>0.0% (0)</td>
<td>15</td>
</tr>
<tr>
<td>Looking in the clean holding room</td>
<td>0.0% (0)</td>
<td>0.0% (0)</td>
<td>20.0% (3)</td>
<td>40.0% (6)</td>
<td>40.0% (6)</td>
<td>0.0% (0)</td>
<td>15</td>
</tr>
<tr>
<td>Looking in the equipment room</td>
<td>0.0% (0)</td>
<td>0.0% (0)</td>
<td>30.8% (4)</td>
<td>30.8% (4)</td>
<td>38.5% (5)</td>
<td>0.0% (0)</td>
<td>13</td>
</tr>
<tr>
<td>Asking the clerk to order the item</td>
<td>0.0% (0)</td>
<td>6.3% (1)</td>
<td>50.0% (8)</td>
<td>12.5% (2)</td>
<td>31.3% (5)</td>
<td>0.0% (0)</td>
<td>16</td>
</tr>
</tbody>
</table>

4. If a Med-Surg material is missing:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have to find it myself.</td>
<td>0.0% (0)</td>
<td>12.5% (2)</td>
<td>25.0% (4)</td>
<td>25.0% (4)</td>
<td>31.3% (5)</td>
<td>6.3% (1)</td>
<td>16</td>
</tr>
<tr>
<td>I have to ask another person to find it.</td>
<td>0.0% (0)</td>
<td>6.3% (1)</td>
<td>62.5% (10)</td>
<td>25.0% (4)</td>
<td>6.3% (1)</td>
<td>0.0% (0)</td>
<td>16</td>
</tr>
</tbody>
</table>

5. What is the approximate time it takes to find the missing materials if they are missing from:

<table>
<thead>
<tr>
<th></th>
<th>Less than 1 minute</th>
<th>Between 1 and 5 minutes</th>
<th>Between 5 and 10 minutes</th>
<th>More than 10 minutes</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply</td>
<td>14.3% (2)</td>
<td>71.4% (10)</td>
<td>14.3% (2)</td>
<td>0.0% (0)</td>
<td>41</td>
</tr>
<tr>
<td>The clean holding room</td>
<td>14.3% (2)</td>
<td>35.7% (5)</td>
<td>42.9% (6)</td>
<td>7.1% (1)</td>
<td>14</td>
</tr>
<tr>
<td>The equipment room</td>
<td>0.0% (0)</td>
<td>50.0% (6)</td>
<td>33.3% (4)</td>
<td>16.7% (2)</td>
<td>12</td>
</tr>
</tbody>
</table>

answered question 16  
skipped question 0  
answered question 16  
skipped question 0  
answered question 16  
skipped question 0  
answered question 14  
skipped question 2
6. If it takes longer than 1 minute but less than 5 minutes to find missing materials, the reason is mainly because:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are communication delays.</td>
<td>0.00%</td>
<td>2</td>
</tr>
<tr>
<td>The walking distance is long.</td>
<td>18.20%</td>
<td>6</td>
</tr>
<tr>
<td>There are too many tasks.</td>
<td>36.40%</td>
<td>12</td>
</tr>
<tr>
<td>I did not know exactly where it was.</td>
<td>45.50%</td>
<td></td>
</tr>
</tbody>
</table>

Other (please specify) 1
answered question 22
skipped question 2

7. If it takes longer than 5 minutes to find missing materials, the reason is mainly because:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are communication delays.</td>
<td>11.10%</td>
<td>1</td>
</tr>
<tr>
<td>The walking distance is long.</td>
<td>11.10%</td>
<td>1</td>
</tr>
<tr>
<td>There are too many tasks.</td>
<td>22.20%</td>
<td>11</td>
</tr>
<tr>
<td>I did not know exactly where it was.</td>
<td>55.60%</td>
<td></td>
</tr>
</tbody>
</table>

Other (please specify) 5
answered question 18
skipped question 6

8. The quality of patient care is reduced when materials are missing from:

<table>
<thead>
<tr>
<th>Location</th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply</td>
<td>0.0%</td>
<td>28.6%</td>
<td>35.7%</td>
<td>21.4%</td>
<td>14.3%</td>
<td>0.0%</td>
<td>14</td>
</tr>
<tr>
<td>The clean holding room</td>
<td>0.0%</td>
<td>21.4%</td>
<td>42.3%</td>
<td>35.7%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>14</td>
</tr>
<tr>
<td>The equipment room</td>
<td>0.0%</td>
<td>25.0%</td>
<td>50.0%</td>
<td>16.7%</td>
<td>8.3%</td>
<td>0.0%</td>
<td>14</td>
</tr>
</tbody>
</table>

answered question 14
skipped question 2

9. UMHS would be much more efficient if there are no missing Med-Surg materials from:

<table>
<thead>
<tr>
<th>Location</th>
<th>No</th>
<th>Maybe</th>
<th>Yes</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bedside supply</td>
<td>7.1%</td>
<td>21.4%</td>
<td>71.4%</td>
<td>14</td>
</tr>
<tr>
<td>The clean holding room</td>
<td>0.0%</td>
<td>28.6%</td>
<td>71.4%</td>
<td>14</td>
</tr>
<tr>
<td>The equipment room</td>
<td>0.0%</td>
<td>30.8%</td>
<td>69.2%</td>
<td>14</td>
</tr>
</tbody>
</table>

answered question 14
skipped question 2