University of Michigan Health System

Program and Operations Analysis

Analysis of Medical/Surgical Nursing Supply Utilization

Final Report

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Executive Summary

Purpose
According to the Periodic Member Assessment (PMA) conducted by University HealthSystems Consortium (UHC) in April 2003, University of Michigan’s Department of Nursing has annually spent approximately $500,000 more on medical and surgical supplies than other comparable health systems have spent on medical and surgical supplies. The purpose of this project was to identify the major saving areas and to recommend improvements to both Nursing and Materiel Services Center (MSE) Management on the medical/surgical supply utilization.

Data Analysis
Frank Krupansky, director of MSE, mentioned that due to very low profit margins and high competition amongst companies in the supply industry, the least amount of saving opportunities with medical/surgical supplies would be in the ordering/price negotiation process. He cited prior consultants’ reports and research studies conducted. Taking both Mr. Krupansky’s statements and the difficulty of evaluating price negotiations into consideration, we focused on the utilization of high volume and high cost items, particularly personal items.

Using the total patient days per unit for the 2003 fiscal year and categorical divisions (i.e. medical, surgical, Intensive Care Unit (ICU), telemetry/pulmonary, 8th floor) of several UH units, we formed normalized bar charts to visually represent the status of each unit among their categories. The categories were determined using a hospital layout chart provided by Sam Clark, our project coordinator. We established approximately 35 groups of items, which were used among all of our focus units. Having found the total cost for each item category, we divided the cost by the number of patient days of the same unit to normalize our data. Based on our bar charts, we concluded that the highest categories based on cost per patient days were most commonly IV-Tubes, Personal and Wound items for general care units, and IV-Tubes, Central and Dialysis items for intensive care units (Appendix F – categorical comparison). Then, we looked at the top five high cost categories for each unit and analyzed item lists for each of those high cost categories to find the root cause of the costs per patient day (Appendix G - categories by unit, Appendix H- item lists,).

Findings
Based on client recommendation and unit administration availability, we focused on University Hospital (UH) units 4A, 6D, 7B/C/D and 8C. The nursing managers on these units were cooperative and would benefit most from this report, according to our client. Since qualitative data was important in understanding the supply utilization processes, we interviewed the nursing managers and nurses of the above-mentioned units and also observed those units approximately 5 times each. We interviewed and observed approximately 8 MSE staff members because they are responsible for charging the nursing units for medical and surgical supplies and stocking the units’ supply rooms.
Benchmarking
There were questions within the team toward the validity of the PMA benchmarking. After gaining access to the benchmarking software program (Solucient) used to develop the PMA report, our attempts to create our own benchmarks were unsuccessful because the sample size for comparisons (8-10 hospitals in many cases) were too small to make valid conclusions (e.g. statistical significance of 76% for hospitals that use bar coding technology for supplies).

Admission Kits
Our categorical charts showed that personal items were one of the largest costs per patient day (top 5) for fiscal year 2003 (FY03). Many of these personal items are given to all patients upon admission. Based on our interviews with the nursing managers, unit UH-4A is the only unit that provides its patients with standardized admission kits consisting of personal items; patients in other units were given such items based upon the nursing preferences or patient demand. The group of personal items given to patients in UH-4A was the basis for our cost analysis of personal supplies in each unit. 70% of the item costs included in the UH-4A admission kits were necessary for the patients; the remaining 30% were “nonessential” items which could be excluded from the admission kits and only given upon request.

Charge Description Masters
In speaking with the nursing managers in UH-6D and UH-7D, we discovered that those two units were the only ones among our focus units which are using Charge Description Masters (CDM’s). CDM’s are supplies (individual or grouped) that are charged to the accounted for in the patient room cost. These CDM’s offer an opportunity for the units to regain a portion of their supply costs. The other focus units were not aware that there were saving opportunities until they had seen the lists of most costly and most utilized items that we created for their unit. Our interviews with Gwen Kearly, UH-7B/C/D nursing manager, clarified that some of the items which are not charged to her budget anymore were still under her usage for fiscal year 2003. We recommend that Gwen further include supplies used for special procedures as CDM’s, in order to save even more.

Communication Issues
Interviews with the nursing managers revealed a lack of communication between nursing managers and nurses in terms of supply utilization. For example, although it is policy that nurses in unit UH-8C do not provide patients with personal items until the patient requests them, one of the nurses was observed giving admission kits to a patient.

Materiel Services
Some inefficiencies were identified in MSE’s billing procedure, which could result in the nursing units being overcharged. Stock items are charged to the nursing units before they are taken off their shelves in the warehouse and stocked in the supply rooms. If an item is not in the warehouse, its cost is credited back to the nursing unit’s account, until it finally
arrives to the nursing unit in need. Interviews with MSE staff revealed that the paper work could be lost, and the requested item could be placed in the wrong unit.

Individual item issues were identified where observed, but not all could be identified since there are more than 8,000 products in which to find opportunities. We noticed that eleven-ounce cans of shaving cream are used in our focus units. Interviews with nurses revealed that the units were using them only because MSE does not provide them with a smaller size. Negotiations with suppliers would result in some items, like the shaving cream, delivered in more feasibly sized containers to reduce costs. We recommend that MSE work more closely with the Nursing Department to establish a minimum feasible level for patients’ supply needs.

Two of the nursing managers that we talked to mentioned the PeopleSoft and Datamart software programs were not very user friendly. These programs give the nursing managers an opportunity to closely monitor their supply utilization. Sandy Regiani, UMHS Senior Analyst, mentioned that although all the nursing managers have access to Solucient, they rarely use it because of its difficult environment. Solucient allows the nursing managers to benchmark their costs and performances against comparable units in comparable health systems.

**Recommendations**

**Admission Kits**

We recommend using a standardized admit kit throughout all nursing units. All “nonessential” items (shown in Appendix I) should be excluded from the kits and only given upon patient request, or when nurses deem their distribution necessary.

**Charge Description Masters**

Our analysis showed that creating CDM’s for supplies used in non-standard procedures within a unit could help the units reduce costs. A non-standard procedure supply is any item that is not accounted for in the patient room costs. Our recommendation is for all nursing managers to study their most costly item lists (provided in Appendix B) and to determine which of these items are worthy of CDM status. Units that perform the same procedures need to communicate with each other to determine standardized CDM’s. Several nursing managers complained about their budget allocation for medical supplies; CDM’s can increase the unit budgets, because CDM’s are credited to unit accounts as revenues.

**Communication**

The most costly and most used, as well as stock vs. non-stock item lists, should be located in several places so that all the nurses and nursing managers can easily see the cost and volume of the cost driving items, and reduce units’ item utilization accordingly. Having the lists in a visible place would increase awareness of utilization relative to similar departments amongst nursing managers and nurses. Communication within and between units should be improved. The nurses and nursing managers should share their
knowledge to identify best practices and avoid any wasteful deviances from the standards.

**Materiel Services**
To prevent overcharges, items should be charged to the unit after they are delivered to the supply rooms. We recommend that training seminars be offered to the nursing managers to familiarize them with the programs, and to highlight the benefits of regularly using these programs. While accurate data reporting is essential to making the Solucient system useful, several discrepancies in data reported by other hospitals caused skepticism amongst the group. For example, bed capacity for a typical hospital unit is near 30, but a few hospitals reported unit bed capacities of over 600.
1. Introduction

The Periodic Member Assessment (PMA), conducted by the University HealthSystems Consortium (UHC) in April 2003, benchmarked the University of Michigan’s Health System against comparable health systems nationwide. Analysis revealed that the University’s Department of Nursing spent approximately $500,000 more annually on medical supplies than was spent on medical supplies by the other health systems. The purpose of this report is to recommend procedural improvements to Nursing and Materiel Services (MSE) Management, provide utilization information and comparisons to nursing managers and our client, and provide the affected parties with an implementation schedule. Our conclusions are based on flow charts, observation of practices, and supply utilization analysis for the 2003 fiscal year.

1.1 Purpose

Our client, Deirdre Baggot - MBA, RN, Business Analyst - requested that we investigate several nursing units to determine savings opportunities. Our focus was on University Hospital (UH) units 4A, 6D, 7B/C/D and 8C based on client recommendation and unit administration availability. The nursing managers on these units were cooperative and would benefit most from this report, according to our client. To find ways to reduce nursing medical surgical costs, we attempted to identify best practices within the UHC, as well as the UMHS, and we interviewed and observed nursing units and MSE. Our goals were to:

- Present how supplies and their related cost information flow among suppliers, MSE and nursing units.
- Determine the major contributors to medical / surgical supply costs in nursing units and in the hospital.
- Reveal as many savings opportunities as possible related to medical / surgical supply costs.

1.2 Background

Previously, MSE was charged for medical/surgical nursing supplies. Nurses were responsible for billing patients directly for the medical/surgical supply items that each patient required. However, patients were not always properly charged for their supplies, and the lack of patient reimbursement negatively impacted the MSE budget. MSE determined that this procedure was unfair because the parties using the supplies should be responsible for the costs incurred from supplies; i.e., Nursing. In the mid-1980s, at the request of the MSE, the University of Michigan Health Systems (UMHS) decided that these medical/surgical supplies should be charged to the Nursing Department’s budget. MSE is still responsible for ordering and stocking the supplies, but Nursing incurs the cost of these items. Nursing does not bill supplies directly to patients; rather, the cost of supplies is built into the cost of the patient’s room.
In the 2003 fiscal year, most of the nursing units exceeded their budgets, resulting in a deficiency of 1.15% on the total nursing budget. The total cost of nursing commodities was $17,316,112 during this period. Medical-surgical supply costs are a major part of the commodities, which accounted for approximately 15% of the actual nursing costs.

When the PMA report revealed that medical surgical supply costs for eight nursing units were higher than the 50th percentile among comparable health systems, UMHS business analysts decided to identify saving opportunities.

1.3 Current Situation
The PMA report concluded that UMHS Nursing Department has a savings opportunity of $500,000 annually when compared to similar institutions. There are no clear-cut definitions for the criteria that the PMA used, so the extent of accuracy of this report and the Solucient Database it is based upon is questionable.

The University of Michigan Health System has a deep culture and historical background, and changes are not always accepted. This was a discouragement to many of the procedural changes that were considered during the project. In addition, MSE and Nursing management is very busy focusing on current improvements.

The fact that MSE transferred the medical/surgical supply costs to the Nursing budget in the mid 1980’s, and that they are charging nursing for the materials which nursing uses, while MSE still orders and stocks the supplies has created some political tension. The hospital department evaluation system indirectly adds to this tension. The units are evaluated on their budgets (i.e. costs built into the nursing budget relieves costs from the MSE budget). As a result of this, much of the qualitative data we received was biased. Often, the nurses were reluctant to provide information. They thought we were investigating to expose their personal inefficiencies, rather than trying to understand the process.

There appears to be a lack of standardization and understanding of the underlying process, and how materials and information flow through the system. Some nursing managers gave unsure responses when asked about the practices of their nurses. Nurses answered the same questions differently, not only between units, but also within their units.

2. Approach and Methodology
We approached this project by observing nursing units, comparing nursing units, evaluating MSE’s procedures, assessing Charge Description Masters (CDM’s), and searching for other opportunities to reduce costs. This section details these steps.
2.1 Observed Nursing Units

To evaluate the nursing units, we interviewed the nursing managers of our focus units, and then interviewed nurses, nursing technicians, housekeepers and clerks. Below are a few of the questions we asked to nursing staff:

- Do you have excess or shortage of stock on any supplies?
- Are you content with MSE response times, staff and services?
- What do you think could be improved with medical surgical supplies in general?
- What supplies do they send home with patients?
- Do the other units get a lot of supplies from your supply carts?
- Do you get a lot of supplies from other units?
- Is there a predetermined amount that you take into patient’s rooms for a procedure/admittance?

We asked managers which issues they considered for controlling supply usage. Nursing managers we interviewed were:

- Gwen Kearly – UH-7B/C/D
- Rachel Rush – UH-8C
- Michelle Aebersold – UH-4A
- Maryann Adamczyk – UH-6D.

We asked housekeeping staff members about the types and quantities of supplies left in the rooms after patient discharge, and about what they did with them. We also searched for waste that might contribute to high supply costs: nurses using excess or unnecessary supplies, unused supplies thrown into trash, and supplies that were consumed or lost on non-revenue-generating incidents (i.e. staff using hospital’s supplies).

2.2 Compared Nursing Units

We performed internal benchmarking between nursing units at UMHS. We had already established communication with nursing managers and nurses, and had been observing the nursing practices in UH units 4A, 6D, 7B/C/D and 8C. We continued communication with nursing managers and nurses during, and after observing nursing practices in UH units 4A, 6D, 7B/C/D and 8C.

We collected data on admission and discharge kits in our interviews and observations. To investigate how the nursing units we were observing compared to other nursing units within the hospital, we divided them into four groups, shown in Table 2.1. These groups were created using a hospital distribution chart, provided by Sam Clark, our project coordinator. This chart showed which tasks were performed by each nursing unit.
Table 2.1 — University Hospital Groups for Cost Comparison

<table>
<thead>
<tr>
<th>Group</th>
<th>UNITS INCLUDED (UH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensive Care Units (ICU)</td>
<td>5D, 6D, 7D, 4DN</td>
</tr>
<tr>
<td>Telemetry/Pulmonary</td>
<td>4C, 6C, 7B, 7C</td>
</tr>
<tr>
<td>Surgery</td>
<td>4A, 4C, 5A, 5B, 5C</td>
</tr>
<tr>
<td>Medicine</td>
<td>6B, 6C</td>
</tr>
<tr>
<td>8th Floor</td>
<td>8A, 8B, 8C</td>
</tr>
</tbody>
</table>

The bold units in Table 1 represent the units that we focused upon during this project, as directed by the PMA report and client recommendation. Within these groups, we analyzed unit supply costs per patient day for supply categories, and for stock versus non-stock supply costs.

Cost analyses presented in this report are based upon the 2003 fiscal year supply usage files provided by Sue Cockrell, Business Systems Analyst for MSE, and the 2003 fiscal year patient days provided by Sam Clark, our project coordinator. To obtain more objective measures of comparing units, we divided the total costs, or number of items used per year, by the patient days for each unit. Solucient’s database provided the average length of stay for patients in each unit. The average length of stay was used to determine the average amount each unit spends on personal supplies for each patient (not a pure average).

After categorizing the costs and graphing them by these categories, we discussed them with the nursing managers of our focus units to investigate the causes for the differences between different units for particular supply categories (Categories – Appendix F).

2.3 Investigated MSE’s Practices

Supply utilization provides the largest opportunity for cost savings within the supply chain. The quantity of supplies utilized by the nurses directly affects the cost incurred by the nursing units. Given the short time frame allotted for this project and the team’s background in Industrial & Operations Engineering, supply utilization became the focus of our study.

Frank Krupansky, Director of Materials Services, indicated that to minimize supply costs, the largest savings opportunity related to the utilization of the supplies by nurses and doctors; he cited prior health care journal articles and consultants’ studies. The chart from Driving Toward the Extraordinary in Supply Chain Management indicated three areas of improvement in supply chain management: Operations improvements, system enhancements, and supply utilization.

Operations improvement forms the foundations for all other cost savings in the supply chain. Steps in operations improvement include product standardization, vendor consolidation, and best-price negotiations. These improvements provide the least amount of savings opportunities within the supply chain. The MSE department is concerned with
these issues and is constantly re-evaluating its practices; thus, operations improvement was not a focus of this project.

System enhancements are the next step in supply chain improvement. Enhancements include purchasing and supply chain policies, bar coding, and point-of-use dispensing. Due to the scope of our project and the infeasibility of instituting such policies, system enhancements were not pursued.

The same evidence indicated that the area with the least amount of savings opportunity was the negotiation/purchasing of supplies, due to the low profit margin and strong competition within the health care supplies industry. This information directed the focus of our project toward supply utilization at the unit level.

Our references for the above section were:


**Driving Toward the Extraordinary in Supply Chain Management**, Supplied by Frank Krupansky

We observed the practices of MSE staff to determine the process flow and to discover inefficiencies in the stocking process. The materiel and information flow charts are included in Appendix A.

Cathy Gage, MSE Coordinator, mentioned that prior analysis by hospital analysts revealed that charging the patients for supplies generates high labor costs, and the insurance companies likely will not pay all of the charges in a patient’s account. A percentage of all admitted patients are assigned a Diagnosis Related Group (DRG) by their insurance company upon registering at the hospital. The insurance companies pay a fixed amount to the hospital for a particular DRG. With a fixed rate paid to the hospital regardless of how many supplies are used on a particular patient, it is most cost-efficient to use as few supplies as possible (within reason), reinforcing our focus on utilization.

### 2.4 Assessed Charge Description Masters

Our client Deirdre Baggot, directed us to evaluate Charge Description Masters (CDM). A Charge Description Master (CDM) is an item, or a group of items, associated with a procedure not typically performed by a particular nursing unit (i.e. not accounted for in the room costs for the unit). We asked our focus units if they had CDM’s in place, and analyzed the yearly savings from the CDM’s they were using based on the FY03 supply usage files. These savings are shown in Appendix J.
We manipulated the yearly supply usage data and formed lists of the 50 most costly and 20 most utilized items for all of the nursing units. These lists were useful in identifying possible CDM’s and pointing out their corresponding savings opportunities.

2.5 Alternatives Considered

2.5.1 Omnicells

Omnicells are electronic supply cupboards useful for tracking items and charging patients for the items used; they are used in the nursing units for charging pharmaceutical supplies to patients. At our client’s recommendation, we considered their use for medical/surgical supplies as well. Cathy Gage indicated that Omnicells are an expensive and inefficient way of charging the patients. Based on her research experience, they often became “expensive supply closets”, and were sometimes left open so nurses can easily access the supplies. As a result, patients rarely get charged for the items. Nurses stated that the Omnicells currently used for pharmaceuticals are difficult to use. Based on this input and our observations on current Omnicells used for pharmaceutical supplies, Omnicells were not pursued further.

2.5.2 Solucient

Since our project assignment was based on the PMA benchmark analysis, we evaluated savings opportunities mentioned in the analyses. There was concern among our team and Senior management engineers that the PMA analysis might not be an exact comparison between health systems, due to a lack of standardized data reporting methods, especially for billing and accounting for supplies within hospitals.

Access to Solucient, a program with quantitative and qualitative data pertaining to over 300 hospital systems nationwide, was provided by UMHS Senior Analyst, Sandra Regiani. Ms. Regiani informed us that there was no way to determine the relevance of the comparisons gained through Solucient without contacting other institutions to understand their practices.

Using Solucient, we attempted to analyze, whether bar coding patient-chargeable supplies resulted in lower supply costs within a health system. The medical supply costs amongst bar coding institutions were compared to the medical supply costs of institutions without bar coding technology in place (such as UMHS). Though the mean and standard deviation of the supply costs for institutions using bar coding technology was lower than the mean and standard deviation of supply costs for institutions without bar coding, there was not enough data to prove this result statistically significant (there was only a 76% probability of significance). Given this, along with the short time frame of the project, the perceived difficulty associated with contacting administration in other hospitals, and project coordinator Sam Clark’s recommendation, we benchmarked within UMHS only.
3. Analysis, Findings and Recommendations

We focused our quantitative analysis on three main areas: item utilization categories, Charge Description Masters and admission kits. General findings and recommendations are driven by qualitative data from our interviews and observations.

3.1 Item Utilization Categories

Unit supply usage files (provided by Sue Cockrell) contained approximately 35 categories of materials depending on unit. These categories included personal items, IV-tubes, dialysis items, etc.

3.1.1. Findings - Item Utilization Categories

Using the patient days per unit for FY03 and the categorical divisions of the several UH units, we constructed pareto charts for each unit to determine what categories contribute the most to total cost. Figure 3.1 shows a 1st level pareto chart for UH-7B/C. Displayed in the 1st level pareto charts are the five most costly categories for each unit. See the charts in Appendix G for other UH units.

**Figure 3.1 – 1st Level Pareto Chart for UH-7BC Supply Categories – FY03**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Cost PPD</th>
<th>Percent</th>
<th>Cum %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>3.392</td>
<td>16.9</td>
<td>16.9</td>
</tr>
<tr>
<td>FYU</td>
<td>3.177</td>
<td>15.8</td>
<td>32.7</td>
</tr>
<tr>
<td>IV</td>
<td>1.804</td>
<td>9.0</td>
<td>41.7</td>
</tr>
<tr>
<td>IV Labs</td>
<td>1.589</td>
<td>7.9</td>
<td>49.6</td>
</tr>
<tr>
<td>Med Lab</td>
<td>1.387</td>
<td>6.9</td>
<td>56.5</td>
</tr>
<tr>
<td>Ortho</td>
<td>8.724</td>
<td>43.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>

We created 2nd level pareto charts for each of the five most costly categories which show the most costly items that account for ~60% of total cost within that category for that
Figure 3.2 shows the most costly items in the personal items category for UH-7B/C. See the charts in Appendix H for other UH units.

**Figure 3.2 — 2nd Level Pareto Chart for UH-7BC Personal Category — FY03**

7BC Personal Category Cost PPD - FY 2003

<table>
<thead>
<tr>
<th>Item No</th>
<th>Cost PPD</th>
<th>Percent</th>
<th>Cum %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.355</td>
<td>0.5</td>
<td>15.8</td>
</tr>
<tr>
<td>2</td>
<td>0.408</td>
<td>12.0</td>
<td>27.8</td>
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<tr>
<td>3</td>
<td>0.279</td>
<td>8.2</td>
<td>36.0</td>
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<tr>
<td>4</td>
<td>0.218</td>
<td>6.4</td>
<td>42.5</td>
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<td>5</td>
<td>0.144</td>
<td>4.2</td>
<td>46.7</td>
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<td>6</td>
<td>0.092</td>
<td>2.7</td>
<td>49.4</td>
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<td>0.092</td>
<td>2.7</td>
<td>52.1</td>
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<tr>
<td>8</td>
<td>0.085</td>
<td>2.5</td>
<td>54.6</td>
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<tr>
<td>9</td>
<td>0.081</td>
<td>2.4</td>
<td>57.0</td>
</tr>
<tr>
<td>10</td>
<td>0.080</td>
<td>2.2</td>
<td>59.4</td>
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<tr>
<td>11</td>
<td>0.075</td>
<td>2.2</td>
<td>61.6</td>
</tr>
<tr>
<td>12</td>
<td>1.303</td>
<td>38.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

3.2 Admission Kits

There is no standard procedure within nearly all nursing units for providing patients with personal items upon admission. Rachel Rush, UH-8C nursing manager, indicated that there could be some lack of communication among the staff regarding personal supply distribution procedures. Only one nurse that we interviewed told us that they were providing patients with admission kits in UH-8C. UH-4A is the only unit to provide all their patients with a standard set of personal items upon admission, while the other four units on which we focused give them only upon patient request. We developed two alternatives, both of which would provide a varying degree of savings opportunity. The first option was to eliminate the admission kits, since nurses in UH-4A indicated that a majority of the items provided go unused. The second alternative was to make a standardized admission kit which would only include the necessary items, and additional luxury items (shown in Appendix I) would be provided only upon patient request.

UH-4A nurses distribute a standard set of personal items to each patient admitted to the unit, and these item sets are placed in the patient’s room prior to their arrival. The following items are given to each patient in UH-4A:

- Non-sterile plastic graduate
- Disposable wash basin
- Mouthwash
- Toothbrush
- Baby powder
- Toothpaste
- Emesis basin
- Slippers
- Soap
- Soap Dish
- Shampoo
- Hand towelettes
- Tissues
- Hand Lotion
- Urine Jug (male only)
- Comb (male only)
- Specimen Collector (female only)
- Brush (female only)

This group of items is referred to as an “admission kit”. Though not all units distribute these items in the same manner used by UH-4A, each of these items is highly utilized in all units. Therefore, the admission kits in UH-4A are the foundation for standardized personal item utilization analysis in all units.

3.2.1 Findings - Admission Kits

Analyzing the categorical costs per item unit, we discovered that personal items were among the most costly per patient day. Nursing managers commonly stated that high supply costs for certain item categories were based on a larger utilization of a set of supplies due to specialized medical procedures performed within their unit. Personal items provided a sound comparison because they are used in each unit and are distributed to patients regardless of medical condition, eliminating any argument based upon differences in medical procedures.

The following pareto chart displays the admission kit items, from the most expensive (per unit cost) to the least expensive. Unit costs for each item were listed in the item utilization reports for each nursing unit.

*Figure 3.3- Unit Cost Chart of Items in Admission Kit (UH-4A)*
To determine a more representative ranking of the nursing units based upon admission kit item costs, these average costs per patient were divided by the average length of stay; this provided the average admission kit item costs per patient, per day, for each unit. We expect that units with longer average lengths of patient stay will consume more admission kit items, so these rankings will account for this variation. Table 3.1 ranks each unit, and lists its average length of stay, average cost per patient, and average cost per patient per day.

**Table 3.1 - Comparison of Nursing Units Based Upon Admission Kit Item Costs Per Patient, Per Day (in increasing order)**

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Unit (UH)</th>
<th>Avg. Length of Patient Stay (Days)</th>
<th>Total Avg. Cost Per Patient ($)</th>
<th>Total Avg. Cost Per Patient Per Day ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6A</td>
<td>20.16</td>
<td>4.79</td>
<td>0.24</td>
</tr>
<tr>
<td>2</td>
<td>8A</td>
<td>10.17</td>
<td>3.43</td>
<td>0.34</td>
</tr>
<tr>
<td>3</td>
<td>6D</td>
<td>6.72</td>
<td>3.85</td>
<td>0.57</td>
</tr>
<tr>
<td>4</td>
<td>8B</td>
<td>4.21</td>
<td>3.06</td>
<td>0.73</td>
</tr>
<tr>
<td>4</td>
<td>5D</td>
<td>4.34</td>
<td>3.15</td>
<td>0.73</td>
</tr>
<tr>
<td>6</td>
<td>8C</td>
<td>3.37</td>
<td>2.84</td>
<td>0.84</td>
</tr>
</tbody>
</table>
The three highest ranked nursing units in table 3.1 all had average lengths of patient stay greater than 6 days; the fact that their average admission kit item cost per patient per day was significantly lower than any of the other units suggests that the personal item utilization per patient is not linearly distributed against time. That is, a patient is able to make use of admission kit items for a long period of time without requiring more. As a result, more reasonably sized admission kit items are worth researching for purchase, and nurses should feel comfortable supplying patients with admission kit supplies only upon request to reduce item utilization. The rankings are more applicable for comparing units with similar average lengths of patient stay, i.e. among units with average lengths of patient stay less than 5 days.

Interviews with nurses in UH-4A revealed that several items given to patients upon admission typically went unused, and were either disposed of or sent home with the patients upon discharge. Based on these interviews, the following admission kit items are considered “nonessential”:

- Comb
- Brush
- Hand Lotion
- Shampoo
- Toothpaste
- Soap
- Toothbrush
- Soap Dish

We analyzed the cost-savings potential of limiting the use of these items. The potential cost-savings for each unit is shown in Table 3.2, assuming that the use of “nonessential” items is eliminated. While it is infeasible to completely eliminate patient use of these items, a substantial fraction of the values below can be salvaged by improving utilization. Also shown in Table 3.2 is the percentage of total admission kit item costs spent on nonessential items, per unit.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6C</td>
<td>4.47</td>
<td>3.76</td>
<td>0.84</td>
</tr>
<tr>
<td>8</td>
<td>4A</td>
<td>3.4</td>
<td>3.08</td>
<td>0.91</td>
</tr>
<tr>
<td>9</td>
<td>4DN</td>
<td>3.07</td>
<td>2.92</td>
<td>0.95</td>
</tr>
<tr>
<td>9</td>
<td>5C</td>
<td>4.13</td>
<td>3.94</td>
<td>0.95</td>
</tr>
<tr>
<td>11</td>
<td>5A</td>
<td>3.94</td>
<td>3.78</td>
<td>0.96</td>
</tr>
<tr>
<td>11</td>
<td>7D</td>
<td>4.45</td>
<td>4.25</td>
<td>0.96</td>
</tr>
<tr>
<td>13</td>
<td>4DS</td>
<td>4.08</td>
<td>3.94</td>
<td>0.97</td>
</tr>
<tr>
<td>13</td>
<td>6B</td>
<td>3.62</td>
<td>4.32</td>
<td>0.97</td>
</tr>
<tr>
<td>15</td>
<td>4C</td>
<td>4.95</td>
<td>5.11</td>
<td>1.03</td>
</tr>
<tr>
<td>16</td>
<td>7B/C</td>
<td>3.62</td>
<td>4.32</td>
<td>1.19</td>
</tr>
</tbody>
</table>
### Table 3.2 - Annual Cost-Savings Opportunities Associated with reducing “nonessential” Item Utilization by Unit

<table>
<thead>
<tr>
<th>Unit (UH)</th>
<th>Total Admission Kit Supply Cost for FY03 ($)</th>
<th>Convenience Item Cost/ Savings Opportunity</th>
<th>% of Total Cost Spent on Convenience Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>4A</td>
<td>8,819.30</td>
<td>3,000.69</td>
<td>34.02</td>
</tr>
<tr>
<td>4C</td>
<td>9,005.47</td>
<td>2,578.18</td>
<td>28.63</td>
</tr>
<tr>
<td>4DN</td>
<td>2,902.12</td>
<td>717.52</td>
<td>24.72</td>
</tr>
<tr>
<td>4DS</td>
<td>2,739.54</td>
<td>1,060.84</td>
<td>38.72</td>
</tr>
<tr>
<td>5A</td>
<td>9,264.14</td>
<td>3,254.88</td>
<td>35.13</td>
</tr>
<tr>
<td>5C</td>
<td>9,368.52</td>
<td>2,395.67</td>
<td>25.57</td>
</tr>
<tr>
<td>5D</td>
<td>3,937.89</td>
<td>1,228.11</td>
<td>31.19</td>
</tr>
<tr>
<td>6A</td>
<td>2,315.93</td>
<td>594.03</td>
<td>25.65</td>
</tr>
<tr>
<td>6B</td>
<td>10,342.00</td>
<td>3,501.30</td>
<td>33.86</td>
</tr>
<tr>
<td>6C</td>
<td>9,007.79</td>
<td>3,036.02</td>
<td>35.70</td>
</tr>
<tr>
<td>6D</td>
<td>5,692.25</td>
<td>1,126.36</td>
<td>36.51</td>
</tr>
<tr>
<td>7B/C</td>
<td>17,768.35</td>
<td>6,006.33</td>
<td>33.80</td>
</tr>
<tr>
<td>7D</td>
<td>2,910.55</td>
<td>874.41</td>
<td>30.04</td>
</tr>
<tr>
<td>8A</td>
<td>2,912.61</td>
<td>876.81</td>
<td>30.10</td>
</tr>
<tr>
<td>8B</td>
<td>7,327.30</td>
<td>2,018.76</td>
<td>27.55</td>
</tr>
<tr>
<td>8C</td>
<td>7,720.13</td>
<td>2,226.78</td>
<td>28.84</td>
</tr>
</tbody>
</table>

Personal item utilization analysis was performed for nearly all UH units. Using the total number of patient days per unit for FY03 (obtained by Sam Clark) and the average length of patient stay per unit, we determined the number of patients admitted to each unit in FY03. **Note:** The average length of patient stay per unit was obtained through Solucient as the value for each unit for the 2nd quarter of FY03, which was said to be the most accurate reporting according to Sandy Regiani. The number of patients per unit for FY03, combined with the item utilization data for FY03, provided us with the average number of each personal supply provided to each patient, for each unit. The average number of each personal supply distributed to each patient, per unit, is shown in Appendix I. Multiplying the average supply utilization per patient by supply unit cost provided the corresponding average cost for admission kit items per unit. Figure 4 displays a comparison of each unit’s average admission kit item cost per patient.
3.2.2 Recommendations - Admission Kits

We recommend using a standardized admit kit in all nursing units. The items that should be in these admission kits are:

- Slippers - MSE item codes: #2527, #2528
- Wash Basin - #1971
- Toilet Specimen Collect - #1032
- Graduate - #2005
- Emesis Basin - #1126
- Urinal (Male patients only) - #2044

The rest of the items should be given to patients upon patient request or if the nurse deems it necessary. "Nonessential" items, shown in Appendix I, account for approximately one-third of the total admission kit item costs. Also, since the wash basins are used only for holding supplies, a cheaper alternative for this item could be pursued. Each unit can save a percentage of the totals shown in Table 3.2, annually. This percentage will be determined by the policies adopted by each individual nursing unit toward the reduced utilization of nonessential admit kit items.

We recommend that nursing managers review this data themselves and develop their own procedures for lowering admission kit supply utilization. Potential annual savings on
convenience items of thousands of dollars provides incentive for the nursing managers to research their nurses’ practices further, as they pertain to admission kit item distribution.

### 3.3 Charge Description Masters

After learning about the DRG process, we focused on the patient-chargeable items in an attempt to earn more revenue for each of the nursing units. Since the idea of charging the patients for all of their supplies has been considered and deemed infeasible, we directed our analysis towards items which had high standard item costs and cumulative total costs based on the top cost and utilization lists and nursing managers’ views.

#### 3.3.1 Findings - Charge Description Masters

To more clearly understand the supply utilization for each unit, we constructed lists of the 50 most costly (Appendices B and C), and 20 most utilized supplies (Appendix D) for each unit, both by standard unit price and cumulative total cost for UH units 4A, 6D, 7B/C, 7D and 8C. Interviews with nursing managers indicated that only UH-6D and UH-7D were using CDM’s; some units were unaware of the savings opportunities possible.

While the CDM refunds are allocated to the central budget, and the supply costs for these items to each unit are not negated, these refunds are given back to the units in the form of revenue, which affects the amount of budget allocated to each unit. Additionally, by tracking and presenting the costs of these items, there is a possibility that Insurance Providers may raise the reimbursement amount based on the increased costs shown by CDM’s.

Analyzing the item usage reports for FY03, we determined that UH-6D and UH-7D had saved about $48,899 by making the Continuous Venus to Venus Homofiltration (CVVH) procedure a CDM (see details in Appendix J). Not all the items charged in this procedure have a high item cost, but it is easy to charge them since they’re used along with costly items in the procedure.

The CDM items we considered for each unit were located in the lists of the 50 most costly supplies for the unit. We evaluated the FY 03 usage of several items in our focus units to approximately determine how much the units would benefit, if these items were made into CDM’s.

- In UH-7B/C/D and UH-8C, many of the items with high unit costs were trachs. Table 3.3 shows how much our focus units (excluding UH-4A) spent on trachs in FY 03 and what percentage of their total cost in FY 03 the trachs accounted for.
Table 3.3 – Trach Costs for Units UH 6D, 7B/C/D and 8C for FY 03

<table>
<thead>
<tr>
<th>Number of Trachs Used</th>
<th>UH-6D</th>
<th>UH-7B/C</th>
<th>UH-7D</th>
<th>UH-8C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Trachs Used</td>
<td>335</td>
<td>68</td>
<td>138</td>
<td>163</td>
<td></td>
</tr>
<tr>
<td>Total Trach Cost</td>
<td>$15,431.46</td>
<td>$2,733.44</td>
<td>$5267.39</td>
<td>$7972.16</td>
<td>$31,404.45</td>
</tr>
<tr>
<td>Percentage of Unit’s Total Supply Cost</td>
<td>2.7%</td>
<td>1%</td>
<td>2.6%</td>
<td>4.3%</td>
<td></td>
</tr>
</tbody>
</table>

- Each tracheostomy patient in UH-4A is provided with a collection of supplies upon discharge. These items (shown in Appendix K) have been deemed necessary for each discharge by the doctors in this unit and have been approved by the hospital’s Board. The cost of the items in this kit is $136.12 per patient.

- Every Otolaryngology patient is subject to a standardized treatment involving Aspirating Bronchial Catheters (MSE item #2864). The patients get catheter suction every hour for the first three days, every two hours for the next three days and every four hours for every day they are in the unit there after. UH-4A used 14,054 of these catheters in FY 03 for a total cost of $10,696.50. An otolaryngology patient stays approximately ten days on average, uses a minimum of 108 catheters and an average of 126 catheters. These catheters cost $0.7611 each; 683 adult otolaryngology patients were admitted in fiscal year 2003. Based on these numbers, the hospital could have charged a minimum of $56,142 for otolaryngology patients.

- ICU units within the hospital and some general care units use the Swangantz Catheter Replacement procedure. The items used in this procedure are #31829 (Fiber optic Cardiac Output Oximetry Catheter) and #2244 (Pulse Oximetry Adult Reusable Probe); they can be used separately or together. Table 3.4 shows the costs of these items.

Table 3.4 – Swangantz Catheter Replacement total Costs for FY 2003

<table>
<thead>
<tr>
<th>Unit (UH)</th>
<th>Item # 2244 Total Cost</th>
<th>Item # 31829 Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>4A</td>
<td>$625.52</td>
<td>$0</td>
</tr>
<tr>
<td>6D</td>
<td>$1,563.80</td>
<td>$0</td>
</tr>
<tr>
<td>7B/C</td>
<td>$1,720.18</td>
<td>$0</td>
</tr>
<tr>
<td>7D</td>
<td>$156.38</td>
<td>$413.50</td>
</tr>
<tr>
<td>Total</td>
<td>$4,065.88</td>
<td>$413.50</td>
</tr>
</tbody>
</table>

Item cost of item # 2244 is $78.19
Item cost of item # 31829 is $413.5
3.3.2 Recommendations - Charge Description Masters

We recommend that all nursing managers examine the most-costly item lists, provided in Appendix B and C, to determine which of the high-cost items or procedures with such items are worth creating CDM’s for. The units that are in the same care group (i.e. ICU’s) should communicate with each other to determine a standard list of CDM items (i.e. all ICU’s should have a CDM for CVVH procedure). The nursing managers should also consider the utilization volume when establishing CDM’s. The benefits of added revenue to the nursing units, and the corresponding increase in budget, should be made clear to each nursing manager. Following are some of the items we recommend for CDMs, based on discussions with nursing managers:

- Units in which trachs are not a part of the standard procedure (i.e. not built into the room cost) can charge for trachs by creating CDM’s; UH-7B/C/D and UH-8C are such units. We recommend constructing a comprehensive list of all trachs along with their MSE codes. Every patient that requires a trach will have one of these lists, and every time the patient requires a trach, the nurse will put an X in the boxes next to the corresponding trach. When patient is discharged, the number of trachs the patient used will be charged to patient’s account.

- Tracheostomy take home (discharge) kit items can be made into CDM’s since their cost is approximately $136 per patient.

- MSE item #2864, aspirating bronchial catheter, should be made into a CDM for Otolaryngology patients. The cost of catheters a patient uses can be calculated from the number of days the patient stays after the first six days. The fixed charge for the first six days should be $82 (based on 108 catheters).

- MSE item #2244 (Pulse Oximetry Adult Reusable Probe) should be a CDM since it cost our focus units $4,066 total. MSE item #31829 (Fiber optic Cardiac Output Oximetry Catheter) should also be charged if it’s used with #2244.

3.4 General Observations

General observations include our qualitative findings and recommendations that are obtained by interviewing the hospital staff and observing the process in departments associated with supplies.

3.4.1 Material and Information Flow
We determined the material and information flow based on our observations and interviews. The details of information flow were provided by MSE supervisors. The flow charts can be found in Appendix A.

All nursing units have supply rooms with carts that hold supplies (supply carts). Each item has a designated place and a par level, to which MSE staff replenishes the supply. Periodically, MSE inventory staff enters the supply rooms with a handheld palm top (PDA), counts the number of items on the carts and enters them into the PDA. When MSE personnel return to the MSE warehouse, he/she synchronizes the PDA with the MSE database (PeopleSoft). At this point, the system calculates the cost of needed items based on the par levels, and charges the nursing unit. Then pick-sheets are generated by the Customer Service Representatives (CSR). The pick sheet contains the necessary item quantities for a particular unit. After collecting the items from the warehouse, an MSE stock keeper submits the pick sheet. The items that will be delivered have an X next to them, while unavailable items have zeros next to them. The stock keeper gets a packing list with the available items and their location, and delivers the items to the corresponding supply room.

Stock items get charged to nursing when they are counted as missing during inventory (on the PDA), before they are removed from their shelves in the warehouse. The item is credited back to the corresponding nursing account if it is not in the warehouse. In this case, the item will be included in the pick-sheet for the next scheduled supply delivery to the supply room, and will be charged to the unit again. If the item still has not arrived to the warehouse from the supplier, it will once more be credited to the nursing unit. This cycle of unnecessary debiting and crediting proceeds until the item arrives at the warehouse and is available for stocking. While it may be worthwhile to analyze the errors resulting from this cycle, and their frequency, we did not have the time or resources to perform it.

Also of note, non-stock supplies are not returned to suppliers or credited back to the corresponding nursing account if they are unused. If an order is placed by phone for a supply when the PDA is still not synchronized with the system, the PDA overrides the previous data. For example, if the par cart is missing three items and MSE staff enters this into their PDA, while he/she is checking another supply room, the nursing unit calls and orders two of the same material from MSE. MSE charges the unit for two items. When the MSE staff person in charge of inventory synchronizes the PDA contents into the system, the unit gets charged for three more items, but the amount in the PDA overrides the amount ordered by phone, so only three items go up to the unit instead of five that is charged.

3.4.2 Recommendations - Material and Information Flow

The following recommendation pertains to the flow of materials, and the corresponding information, within the MSE department.
Items should be charged to the unit upon their delivery, for the exact items delivered and their corresponding cost, rather than upon synchronizing the PDA. This will reduce possible errors in the debit-credit cycle, and eliminate instances when a PDA overwrites a phone-in order. PeopleSoft should be adjusted to charge for the item number that is going to be delivered to the supply rooms (i.e. MSE staff enters the amount he/she is putting on the cart into the PDA, and then synchronizes the PDA).

3.4.3 Supply Utilization

Our general findings on supply utilization are based on interviews and observations, and the item usage reports for FY03 (Appendices B,C,D). Developing lists of the most costly and most utilized items, and discussing them with the nursing managers revealed several improvement opportunities. They are discussed below:

**UH-7B/C/D – Per Gwen Kearly, Nursing Manager**

- Item #1711 (8” x 10” ABD Nonsterile Pad—the highest volume item in UH-7D) is unnecessary, and it cost the units $2041 in 2003.

- Item # 2216 (Adult Oximax Disposable Probe) and #1319 (Pulse Oximetry Cable) do not need to be used in UH-7B/C/D. These items work together, and cost $1775. There is a less expensive alternative that meets the unit’s demands that is supposed to be used in this unit. Gwen Kearly said she will prohibit the ordering of the expensive alternative within her units.

- Item #23149 (14 ft x 20cm Schon Temp Catheter) was not an item used in UH-7D, though five of them accounted for $545 in the UH-7D budget for FY03. This may have been an MSE mistake.

- Other telemetry/pulmonary units were not using item #25795 (8 mm x 100 ft Nonsterile Suction Tubing), and the nursing manager stated that she’d be interested in finding out how the other units managed without the item.

**UH-8C – Per Rachel Rush, Nursing Manager**

- MSE item # 2079 (External Ventricular Drainage Monitoring System) is not used on UH-8C, though UH-8C was charged 20 of them for a total cost of $2713. This item has the highest standard price among items used in UH-8C.

- Looking at the list of the 50 most-costly items by standard item price, the nursing manager decided that some of the items were overstocked in her supply room. 21 out of the 50 items were trachs, accounting for a total cost of $7842. UH-8C does not have tracheostomy patients often, and number of trachs stored in the area could be decreased, as far as half of the stock par levels for some trachs.

- Upon visiting the supply Room with Rachel Rush to investigate the trachs, she discovered many trach boxes, both opened and unopened in an unorganized cupboard
next to the supply carts. Most of these items were stock items that can be returned to supply carts, and can be credited back to nursing account.

**UH-4A – Michelle Aebersold, Nursing Manager; Marianne Aranda, clinical nurse III**

- 14 items in the top 50 by cumulative cost list were mostly used by Otolaryngology patients. These patients have been treated at the hospital for only three years, so their supply usage is not accounted for in the room costs.

- MSE item #1127 (Sterile Bone Wax), # 1263 (Direct Print Yellow Identification Band), # 1342 (Disposable Pacemaker Cover), # 4667 (Uropump Urodynamic Tubing), #11402 (Arterial Emboleectomy Catheter), # 25440 (Blue Clamps) are items that are not used in UH-4A procedures. These items cost the unit a total of $2107 in FY 2003.

- Item # 6176 (cut down tray) is an item that is assembled in the hospital and delivered to UH-4A. It is only used in emergencies, but in case of an emergency, the tray in the crash cart is used, in which case the nursing supply budget is not affected. Clinical nurse was surprised to see two of these trays used from the supply room. Upon investigating whether these trays had expiration dates to see if the trays were replaced because they had expired, we discovered that the paper tape seal of an unused tray was broken; the item was technically “used”, and UH-4A would be charged for another tray for $37. There was no expiration date on the tray.

The presence of these most-costly and most-utilized item lists not only highlighted unanticipated issues, but also pointed out the deficiencies in the current data reporting system. The nursing managers we interviewed complained about the low level of user-friendliness of the PeopleSoft and Datamart software programs, which contain item utilization data. The nursing managers would like to view their costs on a periodic basis, as sums for particular items, and that was possible only with “complicated” queries. Currently, most nursing managers receive summed cost data from MSE monthly, and they are able to see their costs for each item ordered individually. Sandy Regiani, UMHS Business Analyst, mentioned that all the nursing managers had access to the Solucient database, useful for benchmarking against other units and institutions, but they showed no interest in learning how to use it.

### 3.4.4 Recommendations - Supply Utilization

The following recommendations pertain to the utilization of supplies at the unit level:

- Nursing managers that viewed our data analysis were able to identify several immediate improvement opportunities. Appendices B, C, D contain data in its ranked state, from which conclusions can be drawn; categorical data in Appendix F and stock vs. non-stock data in Appendix E is useful for helping nursing managers see how their units compare to similar units within the hospital, and will further their
understanding of how supplies contribute to their costs. All nursing managers will benefit by discussing their findings with their colleagues (i.e. is there any reason for unit Z’s IV tube cost to be higher than unit W’s?).

• Training for nursing managers and administrative assistants in the PeopleSoft program will help these professionals to better understand their supply utilization. If they are comfortable with the software program and understand its benefits, they are more likely to regularly use the program to its full potential.

• Identify new patient groups such as Otolaryngology patients whose supply costs are not accounted for in the room costs, and have separate room charges for them.

• Investigate better sealing alternatives for in-house assembled supplies.

• Training should be offered to nursing managers or to members of their staff for using the Peoplesoft Software linked to MSE supply usage and charging database. If the nursing managers can view their high cost and high volume items more often, they can take corrective action immediately as well as understanding patterns for cost and volume drivers.

3.4.5 Nursing

Gwen Kearly mentioned that her units were getting charged for five non-stock supplies (total cost of $4132 for 2003 in UH-7B/C), which also accounted for their high costs in non-stock supply cost per patient day (see Appendix E). She discovered that Catherization Laboratory (Cath Lab) was receiving the revenue for these items, and other units in the hospital weren’t paying for these. As a result, she took action to prevent these item costs from affecting UH-7B/C’s budget. This demonstrates a lack of communication between nursing units.

Communication within the units can also improve. During our initial interview with Rachel Rush, she indicated that UH-8C did not use admit kits. While observing the unit, we saw an admit kit on the satellite station. We asked a nurse passing by what it was; she confirmed that it was an admit kit and all patients were given an admit kit upon admittance. We approached Rachel Rush again regarding this conflict, and upon talking to five of her nurses, she reported that only one of them was preparing admission kits for patients.

The nurses understanding of the underlying systems could be improved. Some nurses thought that MSE charged all the patients for the items they used.

One of the reasons for wasted supplies was “guess ordering”. When ordering items from MSE, the clerk or nurse placing the order may not carefully consider the item and may incorrectly report the corresponding item number. This is problematic, especially when a wrong order is placed on a non-stock item; non-stock items are non-refundable. Gwen
Kearly reported that such an ordering error cost her $526.14 for two tapes in 2003, after which, she required that any items costing more than $100 have her approval before ordering.

3.4.6 Recommendations - Nursing

- Communication within and between units should be improved. Nursing managers should establish standard procedures for supply utilization. The nurses and nursing managers should share their knowledge to identify best practices and to avoid any wasteful deviances from the standards.

- The material flow charts and most-costly and most-utilized items should be displayed in a visible location, where all nurses will be exposed to the cost of such supplies and how their utilization impacts the entire nursing system.

- "Guess ordering" should be eliminated. The ordering catalogues should be customized to units, with obvious visuals to minimize ordering errors.

- A safeguard block could be installed into the ordering system for non-stock items with costs higher than $50. This block should warn the individual placing the order that the item will be non-refundable if incorrectly ordered. For non-stock items with costs higher than $100, a password or permission should be required to place an order.

3.4.7 Materiel Services

Although Frank Krupansky and Cathy Gage stated, and our literature search showed that the most improvement opportunities lay in supply utilization, there still remain some opportunities within the supply ordering process.

- The size of the brand-name shaving cream available for patients is 11 oz. (costs $1.1867 per can) Only one of the focus units (UH- 7 B/C/D) circumvented the high unit cost by reusing one can for several patients, which was the original intention of materiel services. This was not communicated well enough to the other nursing units, resulting in one time usage of the shaving cream as observed in UH—4A.

- During our correspondences with nurses, we also learned that wash-basins were no longer used for washing the patient, and that the units used “bag baths” instead. Currently wash basins are used for the sole purpose of holding personal items distributed to patients upon admission. A cheaper alternative should exist for holding supplies than a solid wash basin.

- Our investigation into personal item utilization revealed that mirrors are a potential saving opportunity among individual items. The mirrors cost $6.85 per item, resulting in a total of $1700 for UH-8C, and $2130 for UH-4A during FY03 (refer to Appendix
B). However, while some of the mirrors are used for aesthetical surgery patients, the rest of them are used to instruct tracheostomy patients to perform supply changes on their own. It may be infeasible to eliminate the use of mirrors in this case, but cheaper alternatives could be pursued.

An MSE staff member talked about “floating” supply costs in the MSE budget. These are usually non-stock items for which the order paperwork was lost, and the item was delivered to a nursing unit without a trace of to which unit it was delivered. In this case, the item is not in MSE’s storage, but is in MSE’s budget. MSE attempts to match recently requested supplies with these floating items to determine which units should be charged for the items. There is no way of verifying whether the units that requested the items and got charged for them, actually received them.

MSE staff collects return bins filled with unused and unwanted supplies in the supply rooms. Non-stock and opened stock supplies are donated to various organizations, including World Relief. Unopened stock supplies are put back into the warehouse inventory and credited into nursing unit account.

Some items on the supply carts have par levels exceeding 100, and are infeasible for MSE personnel to count while checking inventory or replenishing par levels. They usually look at them and determine the missing amount by estimating.

3.4.8 Recommendations – Materiel Services

- Nursing should communicate regularly with MSE to inform them of changes in procedures (i.e. using bag baths instead of wash basins). MSE should work with its suppliers and nursing to optimize the supplies they are purchasing such as the mirrors and the shaving cream.

- The non-stock items should be marked with a bright colored label upon arrival to the MSE warehouse. Such labels provide a visual warning for everybody who handles the materials, from nurses (who will know that the item is there for a special purpose) to MSE staff (who can easily distinguish what can be credited back to nursing budget) and what can be given to World Relief.

4. Recommendations Summary

- Communication within and between nursing units and MSE should be improved.

- Nurses should review the top 50 items by item cost and total cost, top 20 items by volume lists and our categorical analysis, and compare them to other units to identify improvement opportunities, charging errors and best practices.

- UH nursing units 6D, 7B/C/D and 8C charged patients a total of $48,899 on CDM’s in year 2003. They could have charged at least $91,600 more, if they had the CDM’s
that we recommend in this paper. Nursing units should make costly items and procedures into CDM’s.

- We recommend giving the standard seven personal items to the patients upon admittance in all UH units. Convenience/non-essential items given to patients account for approximately the 30% of the cost of the personal items. The convenience items should be given to patients only if the patients request them or the nurses deem it fairly necessary.

- The supplies should be charged to nursing unit after they’re physically put on the nursing supply carts or delivered to the nursing clerk desk.

- Improve ordering system for supplies to eliminate guess ordering by customizing the ordering catalogues to units, with obvious visuals to minimize ordering errors.

- Provide training regarding the database software to assist nursing managers in analyzing their supply costs to control the costs better.

4.1 Plan for Action

We consider the following steps necessary to establish the foundation for further reductions in supply utilization and its corresponding cost. The parties involved, and the dates we give are our team’s recommendations.

4.1.1 Inform Nursing Managers

Beginning in January 2004, nursing managers in each of the UH units should receive the data in the appendices pertaining to categorical item costs and personal item costs. The data’s importance should be explained to the nursing managers, and then left for the nursing managers to consider. Nursing managers can work in teams according to their care group to establish with solutions, explanations, and to share best practices. Competition between nursing units needs to be minimized to strive for reduced supply utilization throughout the hospital.

4.1.2 Standardize Admission Kits

The nursing managers need to inform their staff of the costs associated with personal items based on this report and the data in the appendices, and create standardized admission kits void of nonessential items.

4.1.3 Explore Charge Description Masters

Some of the nursing managers we talked to were already investigating more CDM’s. Our client should obtain a current list of CDM’s from all units and distribute these lists, so that all units know which items are already CDM’s. Moreover, she should also send them the data in Appendix C along with the CDM qualification criteria. By April 2004,
the nursing managers should have a list of new possible CDM's, which they can standardize across units.

4.1.4 Introduce Database

To keep informed of supply utilization, and the best opportunities to operate within their budgets, the nursing managers should have the opportunity and freedom to analyze their supply utilization data themselves. Human Resources should evaluate Datamart and PeopleSoft for staff-friendliness by distributing surveys. If training is feasible and the results could be used effectively, then at least one person from each unit should be trained to use this data to generate weekly reports. Otherwise, Information Technology Support Department should seek complimentary applications, which are easy to manipulate. The training should be done by the end of Fiscal Year 2004.