University of Michigan Health System
Program and Operations Analysis

Analysis of the CSPD Floorside/Non OR Workflow

Final Report

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**EXECUTIVE SUMMARY**

The University Hospital Central Sterile Processing Department (CSPD) is responsible for the decontamination, inspection, assembly processes and sterilization processes for the majority of the trays, linens, and instruments used in operating rooms (OR), clinic room functions, and other venues associated with the main hospital system. The CSPD at the University of Michigan Hospital was created through a recent merger of its tow main groups: Operating Room (OR) and Central Sterile Supply presently referred to as floorside.

Since the merger, the floorside function of the CSPD has experienced a variety of problems such as lost and broken instrumentation, items sent to the wrong location, and a lack of standardization have appeared. The CSPD staff asked an IOE 481 student team from the University of Michigan to observe the current workflow, find the inconsistencies that are leading to the current state, and recommend improvements for the current system.

**Background**

Recently, the workload from floorside customers has been increasing (3% annual growth for the past 4 years based on OR case filings) and improving the process of cleaning floorside customer instrumentation has been identified as a high priority by the CSPD. There are three overlapping shifts throughout the day, each of which is responsible for assembling different categories of items. There are two items that come to CSPD for cleaning: CSPD instruments and requisition items. CSPD instruments are owned by CSPD and brought in by a CSPD employee (“runner”). Requisition items are owned by customers and sent to CSPD for cleaning via requisition process. The items are cleaned and sterilized depending on each item’s needs. Once the items are cleaned, the items are either put back into groups as dictated by the requisition reports or put into temporary storage. An employee from the CSPD who either builds the kits or packages the instruments will then pick up the necessary items from the temporary storage area (recipe cards are used for instructions as to what instrumentation to use), build them, put the items through the sterilizer, and put them into the Material Services Centre (MSC) warehouse. From there, the items are either picked up by the MSC or by the customers themselves. The customers are some of the floorside clinics that send items to the CSPD for cleaning and/or sterilization. The student team was informed that there is currently no way of tracking the items that are getting lost, and that there is no way to tell where in the process they are getting lost or damaged.

**Methods and Findings**

The team performed five types of tasks to evaluate and improve the workflow of the CSPD.

**Conducted interviews and observation.** Each member of the team conducted at least 3 two-hour observations during each of the three shifts to highlight key areas needing improvement and get a better understanding of the process as a whole. The team interviewed eight floorside staff members, including nurses, supervisors, clerks, and technicians, to understand where they
believed most of the issues were occurring. The team conducted a Gemba walk with one of the supervisors, following an interview with the shift manager.

The team developed a heat map and found that the current floorside process is viewed as unorganized, confusing, and difficult. The data that the team gathered from interviews and observations was also used to create the required value-stream maps and surveys.

**Conducted Surveys.** The team created two surveys that focused on the requisition forms used by floorside customers when they bring their instruments to be cleaned and/or sterilized. One survey was for the customers and the other was for the CSPD floorside staff. These surveys allowed the team to get multiple perspectives on the current process. The team received 30 responses between the two surveys. The responses were analyzed using Excel and a Pareto chart.

The team found four key takeaways: a majority, 60% of the employees indicated little understanding of the requisition process, there was a lack of communication in the requisition process, there was poor handoff between shifts, and 92% of employees thought that a color-coding system for steam vs. gas sterilization would be helpful for the CSPD.

**Analyzed existing data.** To gather data on customer demand and CSPD production over the course of the past six months, the team met with the MSC inventory manager on a weekly basis for a month. Trends in demand and the top CSPD customers by demand were determined after conducting an inventory analysis.

The team identified that 10 out of 145 CSPD instruments accounted for 71% of CSPD workflow. On the opposite spectrum, 10 out of 332 floorside customers only accounted for 35% of CSPD workflow; revealing CSPD workflow is driven by instrument type rather than floorside customer type. A Minitab analysis also revealed a high variation in instrument demand.

**Created a value stream map.** After observing the item workflow during shifts, the team created a value stream map for requisition and CSPD instruments. The team used the value stream map to determine current process times, bottlenecks, and non-value added activities. The team conducted a value stream analysis, which led to an understanding of the process times, bottlenecks, and non-value added activities.

**Conducted a literature search.** The team researched three articles to advance the project, specifically on visual cues in a healthcare setting, value stream mapping, and coordinated supply chain management. The team found colored visual cues could help the CSPD staff better identify what type of sterilization needed to be done there by reducing the amount of human error that naturally occurs in the process. The team identified critical elements that needed to be included in the value stream map via the value stream literature. The team identified possible demand forecasting and inventory management for CSPD instruments through coordinated supply chain literature.
Conclusions
The two main takeaways were:

- CSPD instruments needed better tracking process and information transfer to MSC
- The requisition process should be investigated for customer and employee usability.

After analyzing the customer demand data, the team determined that focusing on the most frequently demanded instruments would be an efficient approach to improve tracking process. Therefore the team created a tracking system, involving only top 10 frequently CSPD instruments. The tracking system uses Excel and will reduce information lag time between the CSPD and the MSC and standardize the process for logging items that go through the CSPD.

The team looked into ideas such as placing a colored dot for a certain requisition form depending on what sterilization process is used, a running log of what items can be sterilized by the CSPD, and better instructions for the clinics for filling out requisition forms. In addition, the survey comments suggest that the form layout itself could be arranged to improve clarity. The team saw a strong need to improve customer education on how to fill out the requisition forms.

Recommendations
The team used the data from the MSC to create an Excel sheet that can be used to keep track of the 10 frequently used items on a daily basis. The Excel sheet will reduce information lag between the CSPD and MSC, leading to lower demand fluctuations in the future. The team:

- Created a macro for tracking 10 frequently uses CSPD instruments
- Started talk with tech team to merge MSC software with CSPD in the future.

Furthermore, based on interviews with staff supervisors and other stakeholders, the team provided following steps. These steps will ensure fewer errors and better tracking of requisition items:

- Created an ownership transfer sheet for requisitioned items that are left in either the gas/steam sterilizers or in the pasteurization machine during/over a shift change
- Instituted a colored dot system for requisitioned items as they come in:
  - Gas – green; Steam – blue; Pasteurization – yellow

The team concluded that visual cues would reduce the amount of human error in the process. In addition, creating the sense of ownership during the transfer will increase the desire to make sure that all items are accounted for during a shift change over.

Finally, based on the surveys, the team has provided the following recommendations. These recommendations will improve customer education and fewer errors:

- Establish a clear and concise one-page document that can take the place of all the needed information when learning how to complete the requisition forms.
- Establish a list of all the items that the CSPD has reprocessed (history in online forum).
INTRODUCTION
The University Hospital Central Sterile Processing Department (CSPD) is responsible for the decontamination, inspection, assembly processes and sterilization processes for the majority of the trays, linens, and instruments used in operating rooms (OR), clinic room functions, and other venues associated with the Main University of Michigan Hospital System. The CSPD has two groups working within it whose functions are the same but whose customers are different: the first group services only the University Hospital operating rooms and the second group services floorside/non-OR customers (floorside). The two groups merged in 2011 to form what is presently the CSPD and while the OR side was examined and improved after the merger, the floorside unit has not been evaluated.

The floorside unit of the CSPD cleans approximately 25,000 instruments from more than 150 non-operating room customers across the health system per month. The CSPD floorside unit is currently experiencing a variety of problems, voiced through the supervisors, such as lost and broken instrumentation; items sent to the wrong location; significant labor and material costs associated with replacing lost or damaged instruments; and no standard retrieval processes of the cleaned instruments. The CSPD floorside unit asked an IOE 481 student team from the University of Michigan to observe the current workflow, find the inconsistencies that are leading to the current state, and provide recommendations on how to improve the system. The workflow starts when the instruments arrive in the CSPD and ends when the instruments are picked up by or delivered back to the customers. The student team was responsible for conducting observations and interviews, conducting surveys, analyzing existing data, developing value stream maps, and conducting a literature search. The purpose of this report is to present the findings, conclusions, and recommendations with regard to the CSPD floorside unit.

BACKGROUND
In 2011, the Central Sterile Supply (CSS) and Operating Room (OR) instrumentation cleaning departments merged to form the CSPD. Pre-merger, the CSS focused on 150+ customers including various health clinics at the University Hospital, research facilities, and the University of Michigan Medical School, and the OR focused on University Hospital Operating Rooms and the various needs and demands of them on a regular and ad-hoc basis. Following the merger, the focus on meeting the demands of the OR instrumentation took precedence over the need of the floorside unit. The CSS side of the new CSPD department was not improved while the OR side had several teams investigate how their process could be improved. Recently, the workload from non-OR customers has been increasing (3% annual growth for the past 4 years based on OR case filings) and improving the process of cleaning floorside unit customer instrumentation has been identified as a high priority by the CSPD.

The CSPD operates on three shifts working, with overlap, from 6am – 2:30pm, 2pm – 10:30pm, and 10pm – 6:30am, with items and kits assembled during each shift depending on the needs of
the clinics and when the sets are dropped off. While the three shifts focus on different types of instruments, the flow of items is similar throughout the system, and the following information is relevant to every shift.

The instrument flow through the hospital for floorside unit owned items is shown in Figure 1. Instruments can start anywhere on the figure, but throughout a cycle they will progress from the customers using them to the soiled rooms, back to the CSPD for cleaning and sterilization, onto the Materiel Services Center (MSC), and then back to the customers for use. The MSC is the department whose main responsibility with regard to the CSPD is keeping and updating inventory counts.

![Figure 1: High Level Instrument Movement at the University Hospital](image)

The team focused on the floorside CSPD process (Appendix A), the MSC department, and briefly looked at the customers. The client stressed to the student team that the number of clinical instruments that come through the CSPD process has been steadily increasing and proper documentation and procedures are not in place to keep up with the increased demand and ensuing throughput.

The workflow that the student team analyzed starts with items entering the CSPD in one of two ways:

- Dirty items are picked up by an employee of the CSPD department (referred to as a “runner” within the CSPD department) from soiled rooms all over the hospital with no documentation.
- Instruments enter the CSPD as requisitioned items that must be accompanied by requisition forms.
Instruments can enter the CSPD by the way of a runner, who goes around the hospital collecting dirty instruments from soiled rooms (locations around the hospital where clinics can dump used instruments). All of the instruments in this route are CSPD/University Hospital owned. Once the items enter the CSPD they are cleaned by hand, put into a sonic washer (optional in the requisition process), and then sent through a washing machine. Once the instruments are cleaned, they are put into temporary storage. An employee from the CSPD who either builds the kits or packages the instruments will then pick up the necessary items from the temporary storage area (recipe cards are used for instructions as to what instrumentation goes into specific kits). A member of the MSC, who takes inventory on a daily basis, dictates the number of kits built and instruments packaged. After the kits are built or the items are packaged they are sterilized with either steam or gas (ETO). The sterilized items are then put into the warehouse/storage area, where they will eventually make their way back to the customers.

Items that come in with an accompanying requisition form follow a similar process as stated for items that comes in through the runner. The main difference is that requisitioned items are not owned by the University Hospital but are owned by the individual customers. These items also come in with specific orders for care and sterilization. Requisitioned items only cycle between the CSPD and the customer and do not get placed into soiled rooms.

After completing the stated route, items are either picked up by a member of Materiel Services Center (MSC), delivered back to the customers by a runner or picked-up by the customers. At the shift change, all team members from the two shifts (incoming and outgoing) meet at a central location (huddle board) to discuss kits or groups of items that are currently in process and cannot be completed by the end of the shift. They also discuss problems that were encountered during the outgoing shift.

**Key Issues**
The following key issues drove the need for this project.

- A lack of efficient tracking procedures throughout the CSPD, leading to lost instrumentation
- A lack of effective communication between MSC and CSPD
- A lack of understanding of the requisition process by customers and CSPD employees

**GOALS AND OBJECTIVES**
After several discussions with the client, coordinators, and employees of the CSPD department, the following three goals were established for the project:

1. Create a detailed tracking process for non-requisitioned items that increases the communication between the CSPD and MSC units
2. Create and implement tools that can be used in the tracking of requisitioned items
3. Create material that will improve the understanding of the requisition process for customers

To complete the stated goals, the student team:
- Observed the current flow of items from when they were dropped off in the CSPD to when they got picked up from the warehouse or delivered to their final location
- Identified waste in the current process by conducting interviews and observations
- Created a value stream map to map the current state of the CSPD
- Collaborated with MSC to understand demand patterns for CSPD

**Project Scope**

The project scope included:
- The incoming items, and the cleaning and send-off process for all the non-OR customer instruments coming into the CSPD
- The primary departments involved will be CSPD, non-OR customers
- The transportation method that items get from the clinics to the CSPD

The project scope excluded:
- The cleaning of OR clinic instruments
- The collection method that items get from the clinics to the CSPD
- The technical aspects of machines and cleaning process

**METHODS AND FINDINGS**

The team performed five types of tasks to evaluate and improve the workflow of the CSPD.

**Observations and Interviews**

The team conducted six observations during February to understand the floorside unit of the CSPD’s cleaning and sterilization process in more depth. The team split up into two groups to conduct observations at random time intervals. Each of the three shifts was observed by some, but not all, of the members of the student team. Each member of the team conducted at least 3 two-hour observations in the CSPD totaling 12 hours. Observations took place during the first 3 weeks of the project. The team observed the three shifts that occur at the floorside unit under the guidance of the corresponding shift manager.

The team interviewed eight floorside staff including nurses, supervisors, clerks, and technicians. These interviews happened at the onset of the project. The shift managers explained the overall process and answered questions that the team had prepared for them. The team made sure to speak to the most tenured employee on the floor for each shift, who would presumably know the most about the process. All members of the student team interviewed employees of the floorside unit. Through these interviews the student team gained valuable information on how the floorside unit operated and where the employees thought the problems started. To analyze this
data the team took keywords from their interview notes and created a heat word map. This was able to give the team a visual on the most important issues that faced the department as told to them by the employees. Following the interview of the shift manager, the team conducted a Gemba walk to observe and time the processes, interview individual staff members, and record different time and distance measurements.

The heat word map, constructed from interviews and observations, shows the most cited words in larger text (Figure 2). The main takeaway from Figure 2 is that the current floorside process is viewed as unorganized, confusing, and hard.

![Figure 2: Heat word map compiled from interview notes](image)

The data that was collected from interviews and observations was also used to create the required value-stream maps and surveys.

**Surveys**
The team created two surveys that were filled out by the floorside staff and customers with regards to effectiveness of the requisition process (Appendix B & Appendix C). The surveys were used to collect information regarding the requisition process that was useful for the successful completion of goals 2 and 3. Twenty-five surveys were received from the employees and 5 were received from the customers. The questions in these surveys centered on the requisition forms the customers fill out when they want their own items to be cleaned. The surveys had three types of questions: free-response, where the recipients could write whatever they wanted to; check the box, where detailed answers were already given and the recipient could choose the one that suits their opinion the best; and rating questions, where the recipient
circled a number depending on their feelings towards the topic. The student team created the survey questions and then distributed the survey in paper, online and through email. To reach the employees of the floorside unit of the CSPD, the System Manager placed a pile of surveys in the break room and asked everyone to complete it at some point during their shift. If there was not enough time to complete the survey during the shift, the employees could also go onto the CSPD website and complete the survey through Google Forms. To reach the customers of the floorside unit of the CSPD, an email was sent with a description of the student team’s goals and attached was a copy of the survey with instructions on how the form could be completed online. To reach the customers, the survey was distributed with every requisition that was returned to a customer with the understanding that it would be returned with the next order the customer would like to have processed by the CSPD. The survey collection time was 2 weeks and no surveys were collected after this point. To analyze the data that was received from the surveys, the survey results were all put into an excel sheet and then graphs and a pareto chart were made to prioritize the results.

The survey results pointed to the root cause of several of the problems that the floorside CSPD was experiencing. There were no safeguards in place to ensure the accuracy of the data collected, however since the survey was meant to make the job of anyone who touches the floorside CSPD process easier, the student team hoped that there would be integrity and honesty in the submission process.

The 25 employee surveys provided four key takeaways. The first was that 60% of the employees indicated that they had moderate level or little understanding of the requisition process (Figure 3). A ranking of 1 indicates that employees understand the process and a ranking of 5 indicates that the process is too complicated.

![Figure 3: 60% of CSPD staff have some difficulty understanding the requisition process](image)
Next, a question prompted the employees to indicate what suggestions they had to improve the current requisition process. The question was open ended so a variety of answers were collected. The topics below were the most frequently mentioned.

1. Items are hard to find, given wordings on the requisition forms
2. More communication needed
3. Color coding hoses from the clients would lead to more clarity
4. Have a color indication for steam vs. gas sterilization

The next question asked the employees what they thought was the biggest dilemma leading to problems within the floorside unit of the CSPD. This question had three provided answers and then an “other” category. The question was checkbox style so multiple answers could be provided. Below are the counts of the number of occurrences of specific answers out of the 25 surveys collected.

1. Poor handoff between shifts while the items are being sterilized or pasteurized: 13/25
2. Items getting lost or misplaced during the cleaning/washing process: 11/25
3. Lack of education: 4/25

The final question on the employee survey asked whether the employees thought that color-coding for steam vs. gas sterilization on requisition forms would help in creating more clarity in the requisition process. The results of this question were overwhelming: 23 of 25 employees thought that a color-coding system for steam vs. gas sterilization would be helpful for the floorside unit of the CSPD.

Although only 5 customer surveys were returned to the student team, the following insights have gathered form the responses.

- 4/5 customers stated that they thought filling out the requisition form was easy
- 2 of the customers said they received information to help them fill out the form directly from Julia Jackson, 1 customer said that they learned from the CSPD as they went and then the other 2 customers needed no assistance.
- A majority of the customers said that they had confusion as it pertained to finding out if their items could be sterilized or not.

From these results we can see that the form does not need to be altered but providing outside resources (ex. on the website) could decrease confusion as to what items can be processed.
Existing Data
CSPD currently has billing data for its customers. This data accounts for requisition items CSPD process for its customers on daily basis. However, CSPD does not track any data for floorside CSPD owned instruments. CSPD has manual sheets to account for daily floorside items processed. The team needed to set groundwork for flow of CSPD instruments to create an effective tracking process. The team collaborated with MSC to understand floorside demand for CSPD instruments.

MSC is responsible for transferring CSPD items from CSPD to floorside clinics and use electronic tracking system to account for daily flow of CSPD instruments. The team met with a MSC inventory manager on weekly basis for three weeks to collect demand of CSPD instruments from the month of September 2014 to March 2015. The data consisted of 1000 floorside clinic orders, covering 145 CSPD instruments. The team analyzed this data and conducted 80/20 analysis to identify clients and items that drive most CSPD workflow. The purpose of this analysis was to identify key demand drivers and build an effective tracking process for those drivers. This would lead to better tracking process for CSPD items in future.

After conducting a Pareto analysis of existing data, the team identified that 10 out of 145 CSPD instruments account for 71% of CSPD workflow (Figure 4).

![Figure 4: 10 CSPD items drive 71% of CSPD workflow](image-url)
The team also identified that 10 frequently used CSPD floor side clinics account for 35% of workflow, showing even spread between floorside clinic demand. These findings indicate that CSPD workflow is mostly driven by type of instrument rather than specific CSPD floorside clinics.

The team then analysed the demand flow for these 10 items for the 6 month time period. The demand for these items fluctuates a lot (Figure 5).

![Figure 5: Fluctuations in demand for CSPD items](image-url)

After brief discussion with the MSC inventory manager, the team realized the reason behind demand fluctuation is partly because of information lag between CSPD and MSC. CSPD currently uses manual sheets to account for daily items processed. These manual sheets are then used by MSC to update the inventory levels of CSPD items in their system. This transition could be delayed for up to a day. As a result, the system does not reflect the accurate inventory level of CSPD items. Hence, when a floorside clinic places an order with MSC for CSPD item via a call or stock keeping unit, they receive inaccurate inventory levels of CSPD items, according to the MSC inventory manager. As a result, some clinics tend to over purchase CSPD items for future use, leading to large fluctuations in clinic demand. For instance, on October 19, MSC shipped 112 CSPD instruments as compared to October 22, when CSPD shipped followed by 1022 instruments. The demand increased by almost 10 folds. Furthermore, CSPD does not track the
dirty CSPD items that come in daily. As a result, CSPD does not have control of their items once they are outside of CSPD.

**Value Stream Mapping**
The team developed a value stream map (Appendix D) on the current CSPD process to understand the process in more depth and estimate cycle times. This was initially done for all three shifts. Information was gathered through interviews and observations with CSPD staff. The team identified value added tasks and non-value added tasks. Value added tasks are tasks that change to form of the instruments whereas non-value added tasks do not change the instruments. Value Stream Mapping helped to identify inefficient work process, which led the team to think of ideas to reduce cycle times and optimize workflow. In addition, the team received data on the process time to clean instruments in soiled rooms and data on instruments used by clinics. The team used this data to calculate standard process times for instruments and conducted an 80/20 Pareto Analysis on the most frequent customers of the CSPD.

Once the team had formed the value stream map using the collected information about instrument flow and process times, the Senior Industrial Engineer reviewed the value stream map and provided guidance to insure that it was correct. After conducting value stream analysis, the team was able to understand the process times and non-value added activities. The team used this data when developing recommendations that could help reduce CSPD process times and improve workflow. The final deliverable to the client is a detailed current state value stream map of the morning CSPD shift.

**Literature Search**
A literature search occurred during the first 3 weeks of the project, during which time the team researched 3 articles. The first resource the team looked at was a past 481 project related to demand forecasting. The team used this article as a starting point to gather more information on demand forecasting and gage whether this would be a good tool for the team to use. The next article the team researched dealt with visual cues in a healthcare setting. The team used this article in order to generate ideas for improving the workflow in the CSPD. The team hoped that incorporating visual cues, specifically in the washing process, would facilitate a higher throughput with less error. The last article the team used was about value stream mapping. The team hoped that this article would help them generate an effective VSM to reference later during the project and to benchmark with once improvements were made.

Through the literature search on visual cues [1], the team identified that using color cues for requisition forms would reduce the amount of error that occurs when the customer fills them out. In addition, color visual cues help the CSPD staff better identify the type of sterilization that needs to occur. The value stream literature search [2] helped the team identify critical elements that needed to be in their map, the most critical factor was the addition of the value added timeline at the bottom of the value stream map. Finally the literature search regarding the
demand forecasting [3] allowed the team to learn more about what elements are necessary in order to create an adequate forecast and then how that forecast could be used.

CONCLUSION
After analyzing the data, observing the floorside CSPD process, interviewing and surveying both employees and customers of the CSPD, the student team was able to draw two conclusions regarding the current CSPD system:

- Poor communication between the MSC and CSPD lead to a tracking system for CSPD instruments that is inadequate.
- The current requisition process, while not complicated, is unclear to both employees and customers of the CSPD.

Inadequate Tracking Systems
It was discovered through an analysis of existing data and thorough interviews with the MSC and floorside CSPD, that the CSPD does not have a quality tracking system in place. Manual tracking and documentation, as compared to electronic versions, lead to a lag in information flow between floorside CSPD and MSC. This leads to inaccurate inventory levels of CSPD instruments and results in items being purchased that do not need to be and unforecastable demand levels.

Furthermore, CSPD does not track incoming CSPD instruments providing no inventory management for incoming items. As a result, CSPD does not have control over where CSPD instruments are once the items are processed and leave CSPD.

Unclear Requisition Process
While the student team conducted observations of the CSPD processes, interviews and surveys of the CSPD employees and customers, and a literature search, it became evident that issues relating to requisitioned items in the CSPD stemmed from confusion on all ends. The requisition process is not a complicated one, it is just one that has room for a lot of errors.

Issues arise from the first step, when the customers fill out the requisition forms and send items in for reprocessing. Currently, there are six documents that customers can turn to for assistance when filling out the requisition forms, in addition to reaching out to CSPD directly, however customers continually forget to either put their short codes (department identification number) on the requisition forms or send items to CSPD that cannot be reprocessed (single-use items).

Issues can also be seen on the CSPD work floor. After talking with a shift supervisor it was discovered that there is occasionally confusion as to where the requisition orders should be sent for decontamination, is it gas-sterilization, steam-sterilization, or pasteurization. This problem is
primarily due to the small and occasionally not-seen differences in the requisition forms that require different methods of decontamination.

RECOMMENDATIONS

The following recommendations were provided for tracking CSPD Instruments (Goal 1):

- Provided groundwork to track incoming CSPD instruments better (Implemented)
  - Create macro to track the flow of 10 frequently used CSPD instruments on daily basis (Appendix E)
  - Gather tracking data for future analysis and trends
- Reduced lag in information flow between MSC and CSPD (To be Implemented)
  - Provide electronic transfer for 10 frequently used CSPD items to MSC directly
  - Start talk with tech team to merge MSC inventory software with CSPD

The following recommendations were provided for tracking requisition items (Goal 2):

- Created an ownership transfer sheet for requisitioned items that are left in either the gas/steam sterilizers or in the pasteurization machine during/over a shift change (Appendix F) (To be Implemented)
- Instituted a colored dot system (Appendix G) for requisitioned items as they come in, in order to signify destination/sterilization or pasteurization (To be Implemented):
  - Gas – green
  - Steam – blue
  - Pasteurization – yellow
- Placed an ETO Log Sheet on the sterilization machines (To be implemented). (Appendix H)
  - Requisition forms will then be placed behind the master sheet in a clear folder on each machine.

The following recommendations were provided for customer education for requisition items (Goal 3):

- Established a clear and concise one-page document that can take the place of all the needed information when learning how to complete the requisition forms (To be Implemented). (Appendix I)
- Established a list of all the items that the CSPD has reprocessed (history in new online forum) (To be Implemented).

EXPECTED IMPACT

As the project progressed, the student team created three goals to work towards through the project to improve the CSPD floorside workflow. As the recommendations stated above are implemented, the following impacts will be expected with regard to their respective goals.
1. A detailed tracking process for non-requisitioned items that increases the information transfer between the CSPD and MSC units
   - Information transfer lag time will be reduced between CSPD and MSC
   - Provide data and a better understanding for future work on the topic
   - A standardization in the process of item in-take and flow through the system
2. Create and implement tools that can be used in the tracking of requisitioned items
   - Items will not be misdirected upon entering the CSPD – items meant to be steam sterilized will not accidentally be put into an ETO/gas sterilizer.
3. Create material that will improve the understanding of the requisition process for customers
   - Fewer items will be sent back to customers when they send them in improperly.
   - Items that cannot be reprocessed will not be sent into the CSPD.
REFERENCES


Appendix A – In-Depth CSPD Process

**Incoming Items**
- CSPD Pick-Up instruments from soiled rooms
- Clinics deliver already cleaned and packaged (must be sterilized)
- Delivered dirty from Clinics

**Cleaning**
- Hand cleaned
- Sonic vibration cleaned
- Machine washed

**Storage**
- Organize items after cleaning onto shelves

**Delivering/Pick up**
- CSPD runs kits/instruments back to clinics
- Clinics send someone to retrieve kits/sterilized instruments from CSPD

**Sterilizing**
- Steam sterilization
- Ethylene oxide (Et O gas) sterilization
- Dry heat sterilization
- Pasteurization

**Assembling**
- Use kit recipe cards to build kits
- Retrieve items from storage shelves
Appendix B – CSPD Employee Survey

Requisition Process and Requisition Form Survey

Hello,

We are currently a student team conducting research with the CSPD for a senior design project with the University of Michigan. As part of this project, we would like to gather information regarding your experiences with the requisition process in order to improve the required forms and education materials. We would greatly appreciate it if you will fill out this survey and return it in printed form to the CSPD in the marked folders in the break room or electronically to http://CSPD Employee Survey Or you may fill out this survey online and you can find the link on the CSPD homepage.

Please keep the image to the right (requisition form) in mind as you fill out this survey.

Thank you,
Student Team

Your Name: ____________________________
Phone: ________________________________
Email: ________________________________

1. How would you rate the clarity of the current requisition process?

   1  2  3  4  5
   Clear  Complicated

   Comments (Optional): ____________________________

2. What suggestions do you have for improving the current requisition process and form layout?

   ____________________________

3. In your mind what is the biggest factor that is preventing a successful process flow for requisitioned items?

   [ ] Poor handoff between shifts while the items are being sterilized or pasteurized
   [ ] Items getting lost or misplaced during the cleaning/washing process
   [ ] Other, specify: ____________________________

4. Would different colored requisition forms for gas vs. steam sterilization be helpful?

   [ ] Yes
   [ ] No

!
Appendix C – CSPD Customer Survey

Requisition Process and Requisition Form Survey

Hello,
We are currently a student team conducting research with the CSPD (Central Sterile Processing Department) for a senior design project with the University of Michigan. As part of this project, we would like to gather information regarding your experiences with the requisition process in order to improve the required forms and education materials. We would greatly appreciate it if you will fill out this survey and return it in printed form to the CSPD in the marked folders at the requisition form drop off locations or electronically to [REDACTED] Or go online to the CSPD homepage and fill out the survey online.

Please keep the image to the right (requisition form) in mind as you fill out this survey.

Thank you,
Student Team

Department: ____________________________
Your Name: _____________________________
Phone: ________________________________
Email: _________________________________

1. What suggestions do you have for improving the current requisition process?
   a. Form Layout: __________________________
   b. Ability to get assistance: ________________
   c. Usefulness of help documents: ________________

2. How many people complete the forms within your unit (clinic, department)?
   1 2 3 4 5 Other: __________

3. How would you rate the ease of completing the current requisition forms?
   1 2 3 4 5 Easy
   Difficult

4. What resources have you used for assistance with filling out the requisition form?
   [ ] CSPD Website
   [ ] Instruction Manuals
   [ ] Julia Jackson directly
   [ ] Call the CSPD
   [ ] Other: __________________________

5. How would you rate the clarity of the current requisition process?
   1 2 3 4 5 Clear
   Complicated

6. How would you rate the clarity regarding which items can and which items cannot be sterilized?
   1 2 3 4 5 Master
   Confused
Appendix E– Instructions for Macro from Goal 1

STEP 1: Select Incoming vs. Outgoing to enter data in

STEP 2: Fill in Item Type, Quantity and Initials

STEP 3: Use MSC worksheet to export daily data to MSC
### Appendix F – Shift Change Transfer Sheet

<table>
<thead>
<tr>
<th>Date</th>
<th>Machine Number</th>
<th>Shift Entered</th>
<th>Shift Removed</th>
<th>Supervisor Initials</th>
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</thead>
<tbody>
<tr>
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<td>Morning</td>
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<td>Afternoon</td>
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Appendix G – Example of Requisition Form with Colored Dot

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<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>UNIT PRICE</th>
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</tbody>
</table>

FILLED BY: 
RECEIVED BY: 
AUTHORIZED SIGNATURE: 

ACCOUNTING HDSC
Page 1 of 1
99-10061 154A: 04/13
NOT A MEDICAL RECORD DOCUMENT
### Appendix H – ETO log Sheet

**CSS**

**ETO LOG SHEET**

<table>
<thead>
<tr>
<th>TIME IN:</th>
<th>STICKER</th>
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<td>INITIALS:</td>
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## CSPD Requisition Process Instructions

<table>
<thead>
<tr>
<th>Step 1 – Check Item Reprocessing Standards</th>
<th>Step 2 – Costs</th>
<th>Step 3 – Clean and Dry Items</th>
<th>Step 4 – Package Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure that the items you want reprocessed have protocols approved by the Infection Control Committee (ICC).</td>
<td>The CSPD charges $0.25 per item for cleaning, $5.00 per item for gas (ETO) sterilization, and $0.25 per item for steam sterilization.</td>
<td>Thoroughly clean and dry each item that you would like reprocessed.</td>
<td>Items should be individually packaged using wrappers or peel pouches.</td>
</tr>
<tr>
<td>Pre-clean instruments (items) of gross soil.</td>
<td>If items are dirty and will not be cleaned by your department, <strong>proceed to Step 5.</strong></td>
<td></td>
<td>Each wrapped item or peel pouch <strong>must contain</strong> an internal indicator slip.</td>
</tr>
<tr>
<td><strong>Note:</strong> Disposable products designed and designated for single patient use shall not be reused/reprocessed.</td>
<td>If items are dirty and will be cleaned by your department, <strong>proceed to Step 3.</strong></td>
<td></td>
<td><strong>Label</strong> individual packages/items with the name of the clinic/lab.</td>
</tr>
<tr>
<td></td>
<td>If items will be pasteurized, <strong>proceed to Step 5.</strong></td>
<td></td>
<td><strong>Note:</strong> If used with animals, label the package: “<strong>For Animal Use Only</strong>”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 5 – Bag Items</th>
<th>Step 6 – Requisition Form</th>
<th>Step 7 – Items to CSPD</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Place</strong> the items (peel pouches, wrapped items, dirty items) into separate bags depending on the sterilization or cleaning method.</td>
<td>A hospital standard requisition form should be completed with department name, account number, date, quantity, description of the items, and sterilization method. This form should be attached to the bag.</td>
<td><strong>Dirty Items:</strong> Put the bagged items into a “Tupperware” style container labeled with your clinic name, address, contact phone number and deliver them to the decontamination side of CSPD (UH B2 F310A).</td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> If used with animals, label the package: “<strong>For Animal Use Only</strong>”</td>
<td><strong>Note:</strong> Different types of sterilization require separate forms.</td>
<td><strong>Pre-Cleaned Items:</strong> Put the bagged items into a “Tupperware” style container labeled with your clinic name, address, contact phone number and deliver them to the clean side of the CSPD (UH B2 F406B).</td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> If your unit wants to sterilize some items using gas (ETO) and some by steam, the items need to be placed in separate bags by method of sterilization.</td>
<td></td>
<td><strong>Items will be ready for pick-up the next business day in UH B2F406B.</strong></td>
<td><strong>CSPD Staff</strong></td>
</tr>
</tbody>
</table>

26