To: Marc Finch, Instrument Manager, Operating Rooms and PACUs

Mary Duck, Industrial Engineer and Lean Coach

From: IOE 481 Project Team, Program and Operations Analysis

Department

Cassie Feldman

Hailey Macdonald

Caitlin Rayburn

Meghan Shinska

Date: December 11, 2008
Table of Contents

Executive Summary ................................................................................................... 5
Introduction ................................................................................................................ 7
Goals and Objectives ................................................................................................. 7
Background ................................................................................................................ 7
Key Issues .................................................................................................................. 9
Project Scope ............................................................................................................. 9
Approach and Methodology ...................................................................................... 9
  Literature Search ...................................................................................................... 9
  Decontamination Room Flow ............................................................................... 10
  Assembly Room Flow ............................................................................................ 10
  Core Measurements ............................................................................................... 10
  Central Sterile Supply Flow ................................................................................. 10
Findings .................................................................................................................... 10
  Current State ......................................................................................................... 10
  Wrapped Instrument Sets ...................................................................................... 11
  Workplace Safety ................................................................................................... 12
  Situations Contributing to Bottleneck ................................................................. 14
    No Washer Carts Available ............................................................................... 14
    Sonic Cleaner Malfunction ............................................................................... 14
    Communication Issues Between CSS and Core A .............................................. 14
Conclusions and Recommendations ....................................................................... 14
  Wrapped Instrument Sets ...................................................................................... 14
  Metal Instrument Sets ............................................................................................ 15
  New Case Carts ....................................................................................................... 15
  Instrument Set Location and Workplace Safety ............................................... 15
Communication Between the CSS and Core A.................................................. 16
Appendix A – Core Map and Proposed Expanded CSS Blueprint......................17
Appendix B – Core A Map.................................................................................. 18
Appendix C – Core C Map.................................................................................. 19
Appendix D – Decontamination Room Flowcharts............................................ 20
Appendix E – Assembly Room Flowchart.......................................................... 21
Appendix F – Central Sterile Supply Flowchart.................................................. 22
Appendix G – Literature Search Bibliography.................................................... 23
List of Figures

Figure 1: UH OR Case and Tray Daily Averages.....................................................8
Figure 2: Congested Decontamination Room....................................................... 8
Figure 3: Surface of Storage Shelving................................................................. 12
Figure 4: Medical Equipment in Core A............................................................. 12
Figure 5: Current Case Cart Empty................................................................. 13
Figure 6: Current Case Cart Loaded............................................................... 13
Executive Summary

The current University Hospital (UH) Operating Room (OR) instrument cleaning system does not meet desired standards as set forth by instrument room management. The team was asked to investigate a case cart system to improve the flow of the current instrument cleaning process and provide a safe and efficient way of transporting instruments. This report provides recommendations for the initial steps of implementing a modified case cart system. These recommendations will help with pre-work for the renovation of Central Sterile Supply (CSS) beginning January 2009. Due to space constraints in CSS, this case cart system will be a “modified” case cart system, in which only a portion of the instruments will be stored in CSS.

The project details the processes and flaws of the UH OR instrument cleaning process. There is a high influx of dirty instruments mid-day creating a bottleneck. This leaves dirty instruments covered in blood, bone and tissue to sit, leading to corrosion of the stainless steel instruments. The influx of dirty instruments crowds the decontamination room to the point that many dirty instrument trays must sit in the hallways creating hazards. Also, the slow turnaround rate of the current system can create scheduling delays for surgeries.

In response, the team performed a literature search; charted the flow for instrument sets through the decontamination room, assembly room and CSS; and measured the instrument sets and room dimensions of Cores A and C. The team also observed the processes used to clean instruments and store them during the day.

Through observation, the team observed many problems in the current process, as highlighted below:

- Not enough washer carts, which hold dirty instruments, are available to meet demand. This causes instruments to sit before they are placed in the washer. Without enough washer carts, dirty instruments are left in alternative storage areas which create hazards in the workplace. Washer capacity also does not meet the demand of incoming instruments, which causes a queue of dirty instruments (using up available washer carts).
- The sonic cleaner machines experience a large amount of downtime. The sonic cleaner acts as a preliminary step for washing a portion of dirty instruments. When the sonic cleaner is malfunctioning, a queue forms for that machine and creates delays.
- The CSS and the assembly room have difficulty communicating constructively. When CSS wants to send sterilized material upstairs to be stored, they call through a speaker system, saying that a cart of sterilized instrument sets will be sent upstairs. The CSS reported that it can take 3-5 tries for the Core A staff to respond to the call.
After collecting and analyzing all data, a few conclusions were formulated. The team found that the decontamination room, assembly room and CSS processes were very standardized and the bottlenecks were formed by lack of resources and space. After measuring the instrument sets in both Cores A and C, the team determined that in Core A, 56% of the instrument sets were wrapped while 15% of the instrument sets in Core C were wrapped. The current shelving which holds the metal instrument sets and wrapped instrument sets is rough in texture. Because of this, wrapped instrument sets can be easily snagged and become contaminated, requiring them to go through the decontamination process again. The metal instrument sets will eventually be replaced after attrition by Jarit instrument sets which are more standard in height and width. Also, Core A and Core C storage is overcrowded and contains narrow walkways, creating hazards. Finally, the client informed the team that approximately 80% of all instrument sets will be moved from the current storage areas to the newly renovated basement of CSS.

Because of these conclusions, the team formed several recommendations. Case carts and shelving units need to accommodate the largest instrument set in use, measuring 7 in. x 16 in. x 25 in. These carts should also have smooth shelves to avoid snagging of wrapped instrument sets. In addition, the heaviest instrument sets should be placed on a shelf that is equal in height to the new case carts to improve workplace ergonomics. The instrument sets moved to CSS should be organized according to service, utilization, and weight. For emergency purposes, at least one emergency cart per service should remain in each Core. The emergency carts ensure availability of each type of instrument set for any last minute needs.
Introduction

The current University Hospital (UH) Operating Room (OR) instrument cleaning system does not meet desired standards. According to hospital employees, the excess of dirty OR instruments at mid-day is creating a bottleneck. To find the flaws in the current system, the UH OR instrument room manager asked the team to measure the available storage space for clean and dirty instruments, measure the instrument sets holding the tools in the OR, and investigate a set cart system to implement in the instrument room in order to improve the flow of the current system. A case cart system provides a safe, cart-based way of transporting instrument sets. This case cart system involves moving instruments to Central Sterile Supply (CSS). Due to space constraints in CSS, this case cart system will be a “modified” case cart system, in which only a portion of the instruments will be stored in CSS. From the data collected, the team has recommended the size and design of new case carts, as well as improvements to the instrument cleaning process. The purpose of the report is to present findings and recommendations from data collection to assist with the implementation of a modified case cart system.

Goals and Objectives

The objective of this project was to streamline the system of OR instruments from decontamination to sterilization and to determine the optimal number and locations of case carts. The team planned and achieved the following:

- Documented the standardized flow for case carts
- Determined the space needed for decontamination and storage of OR instruments
- Pinpointed causes of bottlenecks in decontamination room
- Determined the size of case carts to be used

Background

According to UH OR employees, the instrument cleaning system used in the decontamination room has many flaws. Because of these flaws, the hospital is looking to renovate the basement Central Sterile Supply room (CSS) and is using this study as part of the pre-work for the renovation, scheduled to begin in January 2009. This renovation would include expanding and changing the layout of CSS through construction. These renovations are necessary, as seen in the following points, which describe the current state:

- A bottleneck effect due to the influx of dirty instruments occurs during mid-day. As Figure 1, provided by the client, shows on the next page, the rate at which instruments are sent to the decontamination room at this time is faster than the rate at which these instruments can be cleaned, creating a backup in the decontamination room.
When the decontamination room cannot clean the OR instruments within one hour, the stainless steel of the instruments starts to corrode, which can damage the instruments and costs money to replace them.

Inadequate space is available to store all of the dirty instruments. Dirty instruments that do not fit in the decontamination room sit on carts in the hallway. These carts of dirty instruments crowd the hallways and create hazards. Another concern is the limited amount of washers available, making it difficult to meet the volume of dirty instruments (see Figure 2).

The turnaround rate of the current system can cause minor delays in scheduling surgeries.
Key Issues

The issues stated below created the need for this study.

- The overflow of instruments in the decontamination room during mid-day creates a bottleneck.
- Inadequate space is available for dirty instruments during mid-day, leaving them to sit in open hallways.
- Tools left unclean for longer than an hour develop corrosion on the stainless steel instruments.
- The current instrument cleaning system is inefficient, sometimes causing delays for surgeries.
- The cores lack proper storage for instruments.

Project Scope

This project included the process of bringing the clean instruments to the OR, moving dirty instruments to the decontamination room, cleaning the instruments and placing clean instruments back in undetermined storage spaces, specifically in Core A and Core C (see maps in Appendices A-C). The original project scope included determining the utilization of the washer in the scope room, which is a decontamination room specifically for medical scopes. However, due to under utilization of the scope room at various times during the day by a company contracted to decontaminate scopes, AltaSurgical, the scope room was excluded from the final project. Due to this, the team is no longer determining the number of washers needed for the new case cart system.

This project will be used for pre-work in design and development of a modified case cart system and the complete renovation of Central Sterile Supply beginning in January 2009.

This project did not include any process not having to do with the OR instruments. Specifically, the team did not study the instruments cleaning process, monetary constraints, patient surgery schedules, and the instrument tracking computer system that UH wants to implement.

Approach and Methodology

The team completed a literature search and observed process flow in the decontamination room, assembly room and CSS. The team measured available storage space and all carts stored in Core A and Core C.

Literature Search

Prior to investigating the flow of the decontamination and assembly rooms, the team examined information on the following topics:

- Prior IOE 481 projects
- Warehousing
- Case cart systems
- The ABC method
• Lean supply chain
• Instrument processing
• Central sterile supply

Decontamination Room Flow
On September 30, October 3, and October 7, 2008, the team observed the decontamination room at peak hours with hopes that the influx of instruments would be highest at this time. The team observed 10-15 carts coming into the decontamination room directly after surgery.

Assembly Room Flow
On October 3 and October 7, 2008, the team observed the assembly room during peak hours. Observations were taken to determine the process instruments follow from when the instruments leave the washers until they are placed in instrument sets and sent to CSS. The team observed 12 – 15 instrument sets being assembled.

Core Measurements
On October 22, November 13, November 14, and November 22, 2008, the team measured the instrument sets and the room dimensions of Cores A and C in order to create a current Core C layout and confirm the validity of the Core C layout provided by the coordinator. The team also measured the size of all the instrument sets contained in both Cores. This data was used in updating the current database of instrument sets. It was also used to develop proposed layouts of the Cores and CSS.

Central Sterile Supply Flow
On October 23, 2008, the team met with the CSS Manager and performed initial observations. On November 6, 2008, the team returned to CSS during peak hours to observe the cycle that instrument sets take during sterilization.

Findings
The team’s observations indicate that the flow of the instruments from the decontamination room through the assembly room to CSS is a standardized process. From the team’s observations, the bottlenecks in the instrument room are caused not by the flow of instruments or staffing inefficiencies, but by lack of proper space and equipment. This space and equipment deficiencies support the initial information provided to the team by the client and coordinator that bottlenecks occurs when the number of instrument sets needed to be processed is at its peak, during mid-day, as shown in Figure 1 on page 7.

Current State
Appendices D-F shows the flows determined from by the observations in the decontamination room, assembly room, and CSS. In the decontamination room, an OR attendant brings a cart full of instrument sets into the decontamination room and removes all paper and plastic for recycling. The instrument sets are then placed on a queue rack. Instrument sets from the queue rack are either hand washed, machine washed, or sent
directly down to CSS. If the instrument set is hand washed, it is washed in a sink located in the decontamination room, then placed in a dryer. After it is dry, it is carried to the assembly room. If the instrument set is machine washed, it is initially sprayed and rinsed off, and if necessary, placed in the sonic cleaner to loosen blood, bone, and tissue. It then goes onto a washer cart that waits in line until the next machine is available. After the machine wash, the washer cart exits the washer into the assembly room (see Appendix D).

Once the instrument set is washed, the washer door opens into the assembly room, which contains only clean instruments. After talking with assembly room employees, the team learned that the employees usually know which type of instrument set is exiting the washer. If not, they compare the items to a checklist. Each employee ensures that the correct instruments are placed in the instrument set. If a instrument is missing, the assembly room employee first tries to locate it on another washer cart. If the missing instrument cannot be found, it is retrieved from a cabinet containing extra instruments. If excess instruments exist, the assembly room employee first checks to see if they are from another instrument set. If the employee cannot locate the instrument set the instruments came from, they are placed in the cabinet. Once a instrument set has been assembled, it is either wrapped in sterile wrap, or placed and locked in a metal instrument set holder. Finally, it is sent down to CSS (see Appendix E).

Once a cart full of instrument sets exits the assembly room, it is taken to the Core A elevator to go down to CSS. The cart is then removed from the elevator and the paperwork is processed to determine which method of sterilization the instrument sets require. In order to prepare for sterilization, two test packs are added to the cart. The first test pack is a Bowie-Dick test, which ensures spore termination. The other test is a steam test, which ensures all seals are intact in the sterilizer. The cart is then placed in the appropriate sterilizer, either the steam sterilizer or gas sterilizer. The steam sterilizer has three different cycles: 4 minutes, 5 minutes, and 8 minutes each with a 45 minute dry time. The gas sterilization cycle time is 2 hours 10 minutes with a 17 hour ventilation period. After sterilization, the instrument sets are taken out of their respective sterilizers, taken back to the elevator, and sent up to Core A (see Appendix F).

**Wrapped Instrument Sets**

The team observed in the Cores that the shelving has a rough surface (see Figure 3 shown on next page), which can easily lead to snags in the wrapped instrument sets. According to the client, when a snag or tear occurs in these wrapped instrument sets, the sterilization is compromised and the instrument set must be reprocessed.
Workplace Safety

While observing Cores A and C, the team observed several hazards to staff safety. Both Cores have narrow walkways with instrument carts on either side. Some areas are also cluttered with medical equipment that block access to some of the instrument carts, as shown in Figure 4. These obstacles require staff to maneuver around the equipment to reach instrument sets.
Also, many of the instrument sets are very large and heavy. When these instrument sets are located on high or low shelves, staff must reach or bend to retrieve them, causing a risk for back strain. The Operating Room Administrative Assistant estimates that there is at least one back injury per week due to this problem.

Furthermore, the current carts were made to hold basins. They have two large holes in the top in which the basins are held. They are not sturdy and are not sufficient for holding these instrument sets (see Figures 5 and 6).

Figure 5: Current Case Cart Empty

![Current Case Cart Empty](Photograph taken by IOE 481 Group 7, November 22, 2008)

Figure 6: Current Case Cart Loaded

![Current Case Cart Loaded](Photograph taken by IOE 481 Group 7, November 22, 2008)
Through observations, the team identified situations that contribute to the mid-day bottleneck.

**No Washer Carts Available**
Sometimes, no washer carts are available for dirty instruments. A washer cart is a three-shelf metal cart on which trays of instruments are placed when they enter the washer queue. These washer carts are placed on a conveyor that automatically loads them into a washer after a washer has finished its cycle and the previous cart of instruments has exited into the assembly room. Without these carts, the employees process instruments until no space is available for them either on the counters or handcarts. During three observation periods, the team saw that the demand for washer carts was significantly higher than the number of washer carts available.

**Sonic Cleaner Malfunctions**
The decontamination room has two sonic cleaners, machines that submerge the dirty instruments and use sound waves to break up the contaminants on the instruments. As can be seen in the decontamination room flow chart (Appendix D), the sonic cleaner is an integral part of processing some of the instruments. When one of these sonic cleaners is out of service, another queue develops within the flow, further contributing to the mid-day bottleneck. During each of the three observations performed by the team, at least one sonic cleaner was down for maintenance.

**Communication Issues Between the CSS and Core A**
While observing CSS, the team documented the flow of instruments from sterilization to storage. To get from CSS to the appropriate storage area, CSS staff must call upstairs on a speaker phone to the Core A. The CSS staff must inform the OR staff member that a cart of sterilized instruments is on the clean elevator, ready to be stored. When the elevator arrives in Core A, the OR staff member takes the cart to the appropriate storage area. However, while observing CSS, the team watched the same sterilized cart be sent up to the Core A multiple times without an OR staff member removing the cart from the elevator. During observations, the CSS Manager commented that it can take up to 3-5 calls before communication is made. Also, due to the nature of the speaker system, staff must yell into the receiver in order for the other staff member to hear them. This can be perceived as unfriendly and can lead to a negative work environment.

**Conclusions and Recommendations**
After thorough investigation and analysis, the team has determined the percentage of instruments sets that are metal, as well as the percentage of instrument sets that are wrapped in permeable paper conducive with the sterilization system.

**Wrapped Instrument Sets**
The current storage shelves are rough and can easily snag wrapped instrument sets. It can be difficult to determine when a wrapped instrument set has become snagged due to the nature of the wrapping. When a instrument set is snagged, it must be re-sterilized. In
order to prevent this from happening, the shelving in the renovated CSS area should be smooth to avoid snagging of wrapped instrument sets when being pulled for an operation.

**Metal Instrument Sets**
The remaining instrument sets are made of metal. Due to deterioration, metal instrument sets require maintenance after approximately 500 uses and need to be replaced after approximately 10 years. When the instrument set becomes ineffective, it will be replaced with one of three sizes of Jarit instrument sets made by Aesculap Surgical Instruments. Jarit instrument sets have a standard height and width and only vary in length. Having standard sized instrument sets will make it easier to store instruments in the crowded Cores.

**New Case Carts**
The largest instrument set measured by the team is the Bookwalter Retractor which is 7 in. x 16 in. x 25 in. The smallest instrument set measured by the team is the Pterygomaxillary set, measuring 9.5 in. x 1 in. by 2 in. Because there is so much variability in the sizes of these instruments, the next step to determine the size of case carts is to look at the size of instrument sets per case. It would be beneficial to have several sizes of case carts in order to accommodate the different sized cases based on these instrument sets. In order to do this, the team recommends determining what instrument sets are needed for each case in order to see the overall size needed for each case. Three to five different sized carts should be chosen that accommodate the different cases in order to maximize the utilization of the cases and so as not to waste space. Ideally, the case carts should be small enough so two or more carts could fit into the elevator to CSS.

To replace the current basin case carts, the team recommends moving to a sturdy cart with strong, flat shelves. Per project client, the carts should also contain doors. The carts should also be able to accommodate a basket on the top shelf for disposable materials.

**Instrument Set Location and Workplace Safety**
The team has pinpointed a large overcrowding problem within Cores A and C, which creates a safety hazard and makes it difficult to locate instrument sets. In an attempt to alleviate this congestion in the Cores, the client approximated that 80% of the total surgical instruments will be moved to the new storage area in the basement upon renovation. These instrument sets should be organized according to service, utilization, and weight. Per the project coordinator, frequently used instrument sets should be placed on middle shelves, while less frequently used instrument sets should be stored on the top and bottom shelves. Specifically, heavy, less frequently used instrument sets should be placed on bottom shelves, with the remaining instrument sets stored on top shelves. This will improve workplace ergonomics and avoid injuries.

Finally, because many of the instrument sets will be moved to CSS, one emergency cart per service should remain in each Core. This ensures availability of each type of instrument set for last minute needs.
The next step for determining the location of the instrument sets is to interview the service leads. These interviews will give a better understanding of what instrument sets absolutely need to be placed in the cores and what sets have the flexibility to be moved downstairs. Next, the team recommends analyzing the available space in CSS based on the proposed blueprints of the renovation to make sure that the determined instrument sets will fit in the designated space.

**Communication Between the CSS and Core A**

In order to alleviate the communication problems caused by the intercom system between CSS and Core A, the team suggests that a corresponding audio and visual alert system be installed. This friendly alert system decreases the possibility of missing the call from CSS that a cart is being sent up the elevator to Core A.
Appendix A - Core Map and Proposed Expanded CSS Blueprint

Core Map

Proposed Expanded CSS Blueprint

Provided by Mary Duck, Coordinator
Provided by Mary Duck, Coordinator

Appendix B – Core A Map
Core A map provided by the team coordinator, Mary Duck.
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Standard</th>
<th>Additional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wound Vac Supplies</td>
<td>60.5</td>
<td>35.25</td>
<td>17.5</td>
</tr>
<tr>
<td>2</td>
<td>General Supplies</td>
<td>69</td>
<td>59</td>
<td>24.5</td>
</tr>
<tr>
<td>3</td>
<td>General Supplies</td>
<td>69.5</td>
<td>59.5</td>
<td>21.5</td>
</tr>
<tr>
<td>4</td>
<td>Burn Inst &amp; Supplies</td>
<td>68</td>
<td>29</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Gynecology</td>
<td>69.5</td>
<td>59.5</td>
<td>24</td>
</tr>
<tr>
<td>6</td>
<td>Gynecology</td>
<td>67.5</td>
<td>30</td>
<td>23.5</td>
</tr>
<tr>
<td>7</td>
<td>Gynecology</td>
<td>68</td>
<td>30</td>
<td>23.5</td>
</tr>
<tr>
<td>8</td>
<td>General Surgery</td>
<td>70</td>
<td>59.75</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>General Surgery</td>
<td>70</td>
<td>59.5</td>
<td>24</td>
</tr>
<tr>
<td>10</td>
<td>General Supplies</td>
<td>68</td>
<td>71.5</td>
<td>24</td>
</tr>
<tr>
<td>11</td>
<td>General Supplies</td>
<td>69.5</td>
<td>59.25</td>
<td>24</td>
</tr>
<tr>
<td>12</td>
<td>Gynecology &amp; Urology Davinci Packs</td>
<td>70</td>
<td>47.5</td>
<td>24</td>
</tr>
<tr>
<td>13</td>
<td>Gloves</td>
<td>68.5</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>14</td>
<td>Peel Packs</td>
<td>70</td>
<td>59.5</td>
<td>22</td>
</tr>
<tr>
<td>15</td>
<td>Urology</td>
<td>70</td>
<td>48</td>
<td>24</td>
</tr>
<tr>
<td>16</td>
<td>Urology &amp; Gynecology</td>
<td>70</td>
<td>59.5</td>
<td>24</td>
</tr>
<tr>
<td>17</td>
<td>Urology</td>
<td>67.5</td>
<td>29.75</td>
<td>23.25</td>
</tr>
<tr>
<td>18</td>
<td>Urology</td>
<td>67.5</td>
<td>29</td>
<td>23.25</td>
</tr>
<tr>
<td>19</td>
<td>Catheters</td>
<td>68</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>20</td>
<td>Catheters</td>
<td>68</td>
<td>30</td>
<td>24</td>
</tr>
</tbody>
</table>

**Appendix D – Decontamination Room Flowchart**

```
OR
  Drapes, Recyclables, Basins, Garbage Separated
  Instruments Placed on Rack
    Instrument needs hand washing only?
      No
  Soaking Sink
    Soak
      Additional Treatment Needed?
        No
      Agitation
    Sonic Cleaner
      No
  Washer Rack
    Washer (3 available)
      Assembly Room
    Hand Wash at Sink
```
Appendix E – Assembly Room Flowchart

1. Washer
   - Wait on Rack
   - Assembly Station
   - Assembled per Checklist

2. Extra Instruments?
   - Yes
     - See if from Another Set or Put Extra Instruments in Cabinet
   - No
     - Hunt Down or Retrieve Extra Instruments from Cabinet

3. Need More Instruments?
   - Yes
     - See if from Another Set or Put Extra Instruments in Cabinet
   - No
     - Put on Cart in Hallway
     - Hunt Down or Retrieve Extra Instruments from Cabinet

4. Wrap Tray or Put in Metal Case
   - Yes
     - See if from Another Set or Put Extra Instruments in Cabinet
   - No
     - Put on Cart in Hallway
     - Hunt Down or Retrieve Extra Instruments from Cabinet

5. Take to CSS for Sterilization

6. Put on Cart in Hallway
   - Wrap Tray or Put in Metal Case
   - Extra Instruments?
     - Yes
       - See if from Another Set or Put Extra Instruments in Cabinet
     - No
       - Hunt Down or Retrieve Extra Instruments from Cabinet

7. Need More Instruments?
   - Yes
     - See if from Another Set or Put Extra Instruments in Cabinet
   - No
     - Put on Cart in Hallway
     - Hunt Down or Retrieve Extra Instruments from Cabinet

8. Extra Instruments?
   - Yes
     - See if from Another Set or Put Extra Instruments in Cabinet
   - No
     - Hunt Down or Retrieve Extra Instruments from Cabinet
Appendix F – Central Sterile Supply Flowchart

1. Assembly Room
2. Core AElevator
3. Central Sterile Supply
4. Paperwork Processed
5. Core Storage

Flowchart:
- Gas sterilization: 2 hours, 10 minute sterilization, 17 hour dry time
  - Yes: Will Instruments Melt?
    - Yes: Quality Tests Inserted
    - No: Core AElevator
  - No: Core AElevator

- Steam Sterilization: 4, 5, or 8 minute sterilization, 45 minute dry time
  - Core AElevator

Decision Point: Will Instruments Melt?
Appendix G – Literature Search Bibliography


