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A cross-discipline approach to healthcare needs

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A Cross-Discipline Approach to Healthcare Needs

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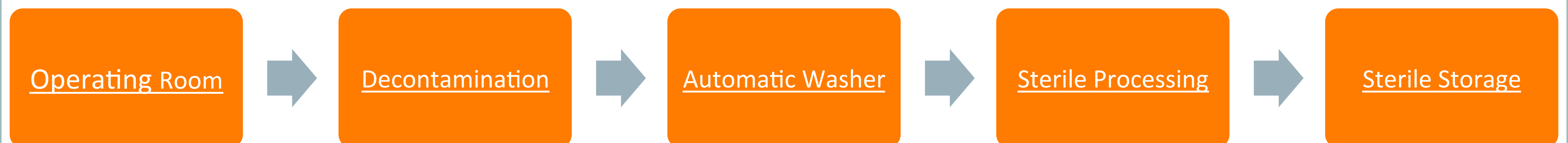
Introduction

Hospitals struggle to find the balance between cost savings and providing the best standard of care. With this goal becoming more difficult, we are taking on the challenge of helping to improve processes across the hospitals. For instance, the average operating room costs \$62 per minute to run¹. Every delay is time and money lost. Not only does this affect the hospital's budget, but it influences the quality of care provided to the patient. This Creative Inquiry is an unique, multi-disciplined collaboration between Industrial and Bioengineers. Our project focuses on the challenges that Modern Healthcare systems face. This team of engineers will be working with Centra Hospital of Lynchburg, VA to analyze current practices and determine problematic areas. Initially, our CI project will aim to improve the existing material management and sterile processing systems. We are approaching this through comparison with other hospitals such as Tuomey in Sumter, SC.

¹Macario, Alex. "What Does One Minute of Operating Room Time Cost?" Journal of clinical anesthesia 22.4 (2010): 233-6. Web. 1 Apr. 2014.

Sterile Processing Department

The sterile processing departments at both facilities handle sterilization of all surgical tools used in the operating rooms. The process begins as the tools leave the room and is not completed until they are returned to sterile storage for future use. Both facilities followed similar practices; however, Centra seemed to have more flexibility in their protocols.



1) A packaged, sterile instrument is opened and used. Once an instrument is unpackaged, it requires sterilization before it can be used again.

2) The used instruments arrive at decontamination to undergo cleaning which removes human tissue (biohazardous waste). The purpose of this is to prepare for the automatic washer, which cannot dispose of biohazardous waste.

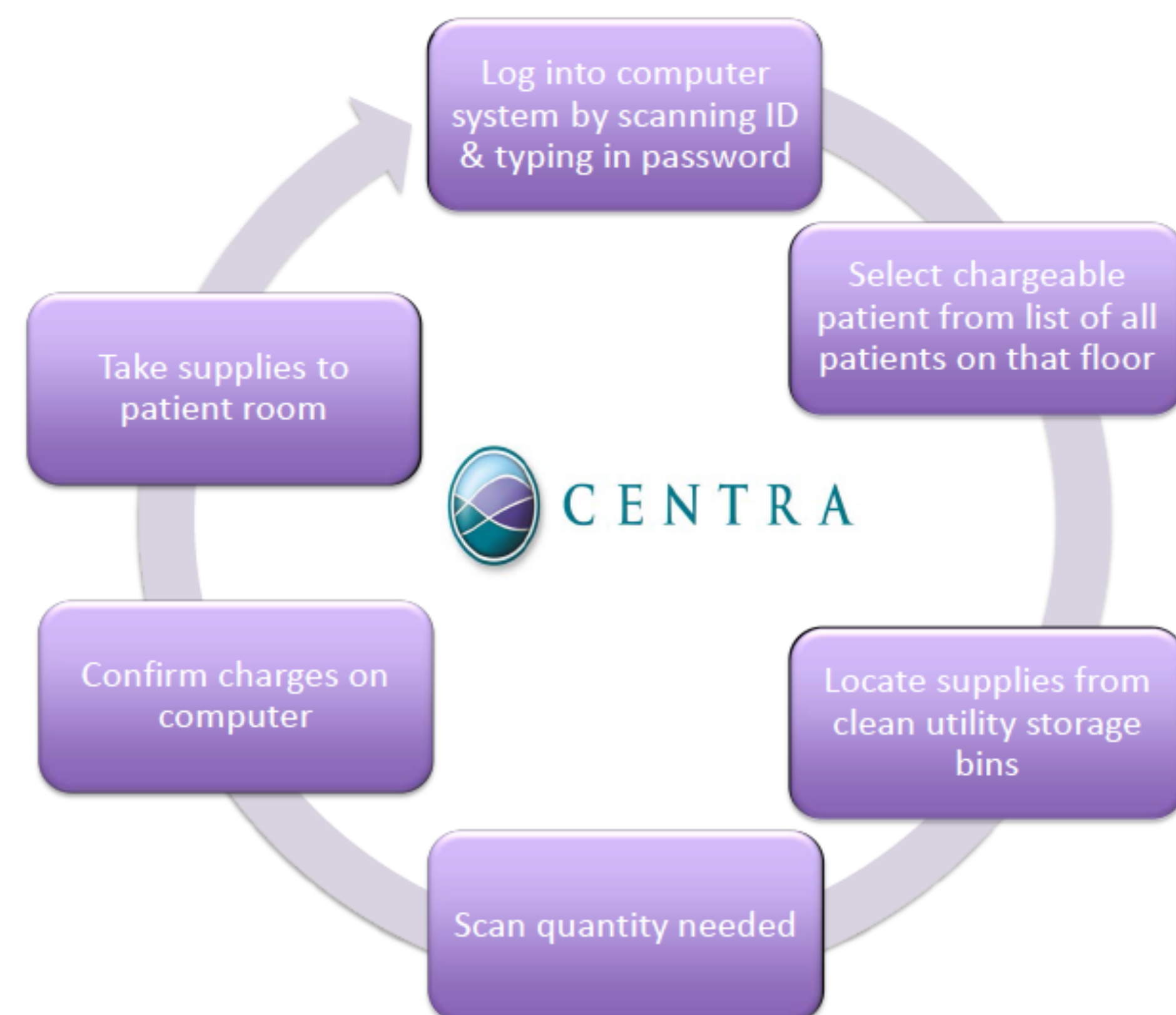
3) The automatic washer resembles a dishwasher. The purpose of this is to reduce the bioburden level so the device can enter sterile processing.

4) The instrument is placed into specific surgical kits that require that instrument. The kit is sterilized, and nothing is removed until the time of the procedure.

5) The instrument or surgical kit is placed in sterile storage until it is required for a procedure.

Materials Management

The materials management department handles all of the inventory other than controlled substances for the entire hospital system. They are responsible for ordering, receiving, tracking, and distributing these items to the appropriate location. Below we have compared and contrasted the processes used by Centra and Tuomey hospitals.



Below: picture of the current storage bins at Centra



TUOMEY HEALTHCARE SYSTEM <i>Bringing more to life.</i>	CENTRA
<ul style="list-style-type: none"> •Per diem room charge •Off-site warehouse with hospital inventory •Materials Management conducts daily inventory count 	<ul style="list-style-type: none"> •Difficulties with supply counts •Storage room on every floor with 1 day of inventory •Difficulty locating supplies quickly in clean utility rooms
<ul style="list-style-type: none"> •Patients charged for all items used •Inventory shipped to hospital every day •Scanning system to track inventory 	

Conclusion

Materials Management:

Our initial investigation has revealed several problematic features of Centra's material management system. These problems are especially a hindrance in the emergency department; it is estimated this department is losing over \$150,000 per quarter.

One feature our team plans to improve is the organization of materials in the clean utility rooms located on each floor. We also aim to reduce the time required for nurses to scan items and make the database system more user-friendly.

Sterile Processing:

Standardized protocols are needed to ensure every instrument is properly decontaminated and sterilized. We are also proposing a tracking system that would allow for more efficient packing of surgical kits. This would serve an additional benefit in case of an infection outbreak because specific tools could be isolated as the cause.

Future Work

For future work, our team will continue to research the available material management systems. We plan to design a customizable system that addresses the issues currently existing for Centra Hospital. In the fall, we will visit Centra to discuss sterile processing more in-depth and to propose possible solutions with management. We will continue to follow up with nurses and management regarding our ideas.

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