Introduction

The IV chemotherapy drug preparation process is a physically and mentally demanding process for technicians and pharmacists at UT MD Anderson Cancer Center (MDACC). There are hundreds of decisions made in every dose by pharmacists and technicians through the ordering process and production process. These decisions include order input data, mathematical calculations, selection of proper medications, proper mixing technique, verification of information on charts and retaining information. This complicated process of over 90 steps from beginning to end is safe guarded by pharmacist’s checks in key points of the process. There is an inherent risk in having human beings be responsible for so many critical decisions during a full shift of work without the aid of technology due to natural fatigue.

This tool is called ChemoCato. This is a product from Chemocato, LLC in Austria. This product consists of a monitor, scale, scanner and software set up in the production room hood which will automate many critical decisions and will not allow the technician to continue the process until certain steps are achieved correctly.

Aim

Reduce waste and risk of errors in the chemotherapy preparation process by piloting an electronic error proofing system called “ChemoCato”.

Methods

Value Stream Map

This tool was used to identify the waste in the current process.

Failure Mode and Effects Analysis (FMEA)

This tool was used to quantify the risk in the current process and evaluate how the ChemoCato process will reduce that risk.

Results

Productivity

Potential yearly savings of indirect labor from non value added wasteful processes (sorting orders, inventory counts, paperwork) is $47,430.

Potential yearly savings of direct labor by reduction in production cycle time is $110,628.

Partial Vial Waste

All drugs selected for ChemoCato pilot showed reduced partial vial waste because the system helps manage partial vial stock and expiration.

ChemoCato Mix Error Warning

Infection (multiple patients) / Expired drug (sterility) / No Dose / Expired Extravasation / Drug Stability Compromised Regulatory Violation / Exposure / Environmental Exposure / Needle Stick Severe Delay (Over 2 hours or require patient reschedule) / Waste - High Cost Drug Major Delay (30 min - 2 Hour), Medium Delay (5-15 min) / Waste - Low Cost Drug Minor Delay (Less than 5 mins) / Waste - Supplies

Chemocato will also help manage the ordering process and eliminate waste activities involved in sorting and prioritizing orders/labels to be produced. Chemocato helps reduce costs by standardizing the process, eliminating unnecessary steps, managing partial vial inventory, communicating live order status to internal customers, and reducing the risk of errors.

Comparing all failure modes of current process with ChemoCato process approximately 52% of failure modes would be impacted as a result reducing risk.

Through FMEA analysis, partial vial waste was identified as the biggest contributor to waste. ChemoCato pilot showed $110,628 reduction in waste due to elimination of partial vial inventory. The system also helps reduce partial vial waste due to better management. Finally the system helps reduce risk of errors by performing risky tasks correctly.

Conclusion

The ChemoCato error proofing system helps reduce waste by automating many manual processes. The system also helps reduce partial vial waste due to better management. Finally the system helps reduce risk of errors by performing risky tasks and decisions performed by technicians and pharmacists. The pilot was a success and the next step is to implement this system in all MD Anderson pharmacies.