

# Improving Medical Equipment Availability at Barnes-Jewish Hospital

by Laurie Wolf and Nancy Sigillito

*special acknowledgement to Cathy Powers (Clinical Nurse Specialist) for directing this project and Barb Sacakli (Patient Care Operations Supervisor) and Tim Trotter (Hill-Rom Regional Manager) for successfully sustaining this process*

For years, a constant struggle existed to get patients at Barnes-Jewish Hospital (BJH) the right medical equipment promptly.

As one nurse described, “our process of providing our patients with necessary equipment was broken. We had no mechanism for tracking equipment that was ordered, no feel for if our inventories are adequate, no follow-up for broken equipment, and most importantly, no way of ensuring that equipment got to patients in a timely manner.”

This broken process resulted in a classic “work-around” by nursing staff. In the case of IV pumps, nurses would be fast to claim a pump from a discharged patient’s room, do a quick cleaning off the record, and use it for their just-admitted patient. Or, they would go to a neighboring unit to “borrow” one— without really intending to return it. Needless to say, nurses were extremely frustrated at the lack of readily available equipment.

Hill-Rom, the hospital’s equipment supply partner, had frustrations as well. Hill-Rom staff retrieve, clean and deliver patient equipment, moving it back and forth from the centralized cleaning area in the basement up to the nursing divisions—as much as a half mile away! There were long elevator waits going up and coming back down. They awkwardly maneuvered lots of equipment at one time, resulting in the use of poor body mechanics. In addition, everyone had concerns about transporting used patient equipment through public areas, risking potential exposure to visitors and staff. Finally, Hill-Rom was unable to answer questions from nursing staff—their customers—about when their equipment would arrive.

To remedy the situation, a Lean/Sigma project was initiated. The primary goal was to enhance patient safety by reducing equipment delivery time and the time nurses spent locating equipment. The scope of the project was initially to improve the availability of IV pumps only. Additional equipment was added after the process was proven to be a success.

Sponsorship for the project came from top administration, and further support was found throughout various disciplines and departments. The medicine patient

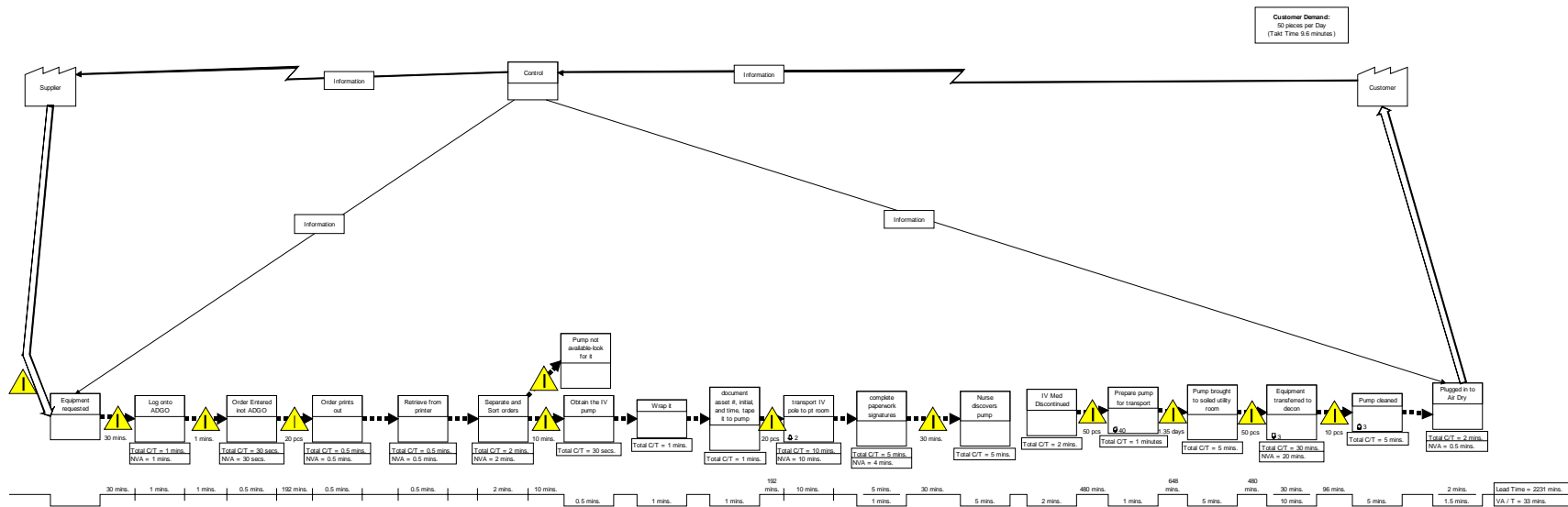


**Before:** Hill Rom employee pushes 6 IV poles and a cart onto an elevator on his way to the centralized cleaning area.

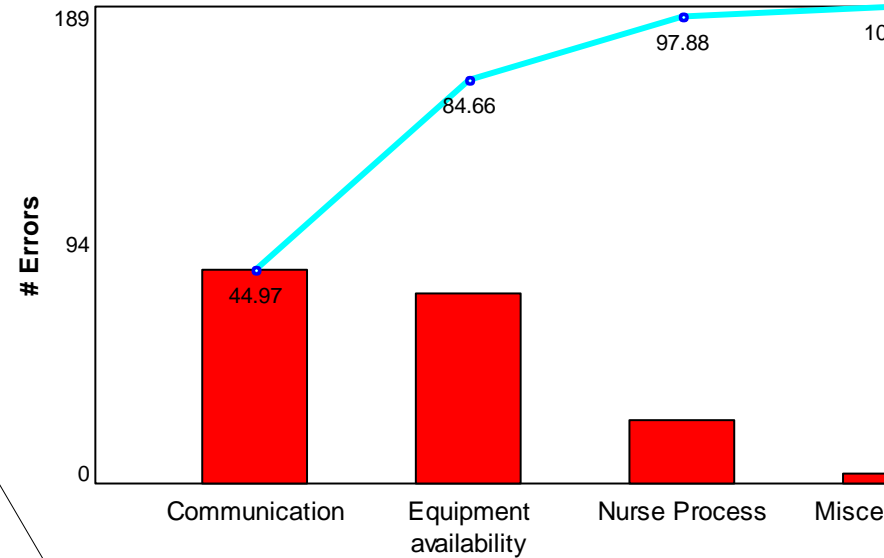
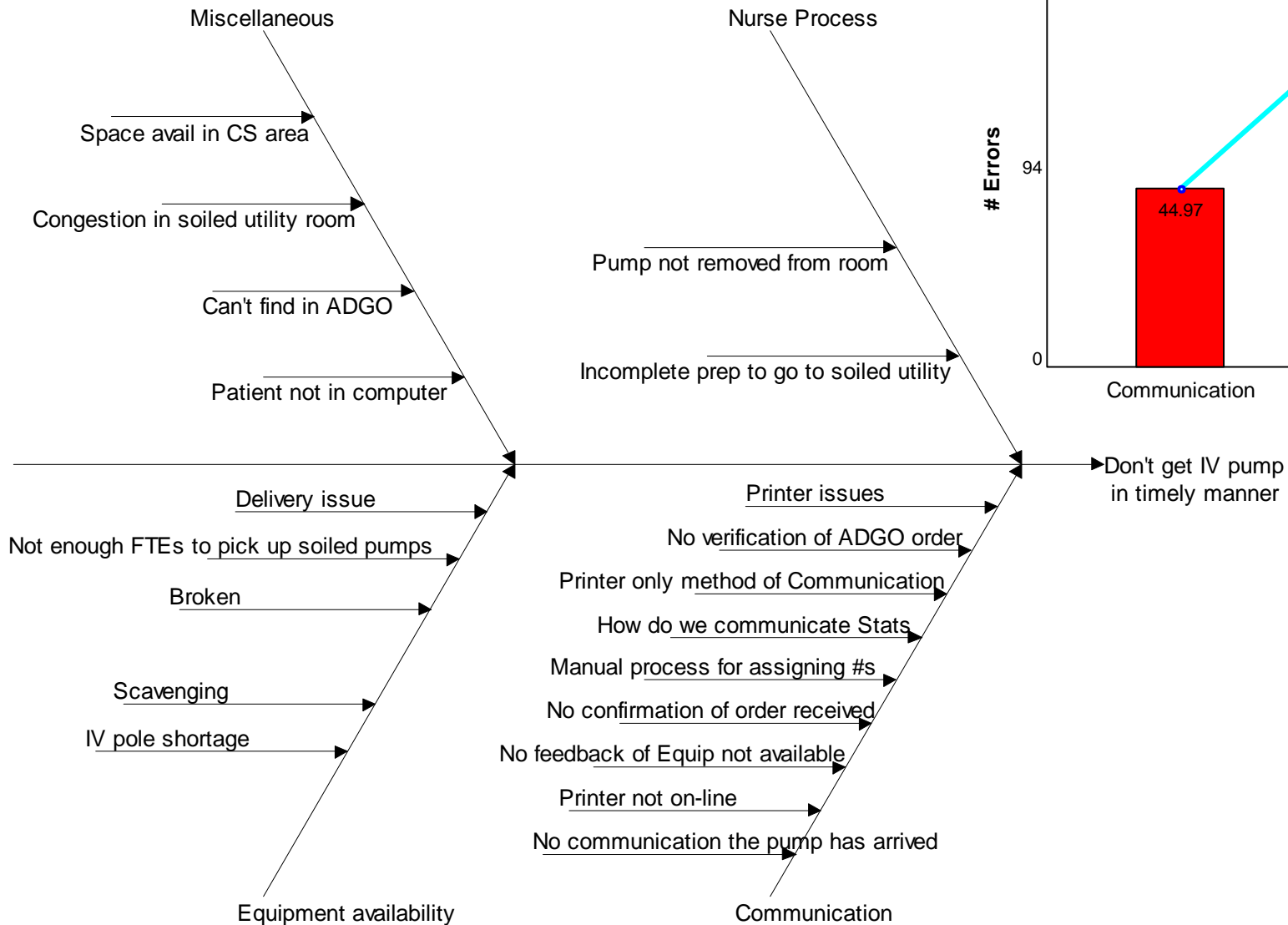
care director served as the project’s executive sponsor. A clinical nurse specialist, conducted the project as part of her Six Sigma certification, and a management engineer was the project facilitator. The project team also included nurses, clinical nurse managers, unit secretaries and representatives from IS, receiving, central sterile processing and materials and supply, as well as staff from equipment supplier Hill-Rom.

With a combination of Lean and Six Sigma tools, the team analyzed the current process for getting equipment to a patient, cleaning it after use and getting it ready for the next patient.

The current state was mapped out in a value stream so all participants could understand the required tasks and roles of everyone involved. The process began with the nurse ordering an IV pump, then the next steps were listed such as; Hill-Rom staff receiving order, delivering pump to requesting nurse, using pump to deliver medication, discontinuing use, returning to soiled utility room, and transporting to decontamination. The process ended with cleaning the pump and preparing for next use. The group then took a “field trip” to walk the entire process to see where each activity was performed. Each process step was reviewed to see if it was value or non-value added. Time estimates were made for each process step.



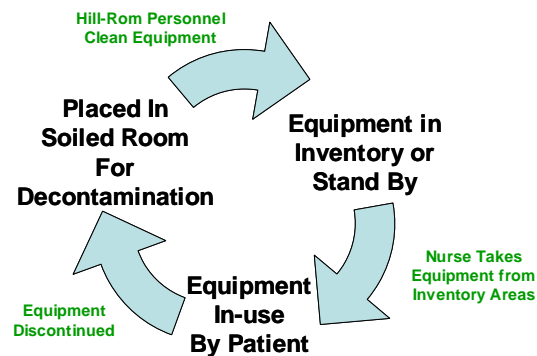
Next, an affinity diagram was developed to understand the reasons why equipment (such as an IV pump) was not available in a timely manner. Numerous reasons were grouped into the following categories: communication, equipment availability, nursing process (such as, if the nurse forgot to remove tubing from the pump, Hill-Rom staff were not allowed to move the pumps until this was completed), among others.



The team also identified the “preferred future state” for the patients, in other words, the ideal end result of the equipment delivery process.

### Maintain Integrity of the Equipment Utilization Cycle

NO equipment should be transferred from patient to patient



The future state required the equipment to be cleaned on the nursing division in the soiled utility room and then placed in the clean equipment storage area ready for next use. This challenged the team to determine how many IV pumps must be stored on each division.

This critical element of the new process involved setting up and maintaining “par levels,” of equipment on specific divisions based on usage. To do this, the team approached unit leadership with an empowering request: how many clean IV pumps would you need on-hand to avoid ever calling downstairs for pump delivery? Initially, the par levels were set to this requested amount, and then adjusted as usage patterns were observed by Hill-Rom staff. One challenge was to balance the number of available IV pumps with the timing of the cleaning process. A 2-hour rounding schedule was set up by Hill-Rom staff. They visited each division at least every 2 hours to check if there were any equipment that needed to be cleaned. Typically they would find that the original par level estimate was too high and the number could be reduced once the nurses trusted that they would always have a pump available when it was needed.

The new decentralized cleaning process is shown in the second image below.

This process begins when the nurse puts the used equipment in the soiled utility room (they are still required to remove the tubes from the IV pumps).

- Inventory is cleaned and stored on the floor rather than the department.
- Par levels of equipment are maintained in designated clean rooms throughout the facility.
- Charge slips are placed on each equipment item by Hill-Rom staff. When needed, nursing staff retrieves an item from the nearest clean room and completes the charge slip.
- After use, the items are brought to a soiled utility room.
- Throughout the day, Hill-Rom staff decontaminate the equipment in the soiled utility rooms and restock par levels in each area.
- Equipment inventory and rounds verification are performed each day.

5S visual cues (e.g. tape on the floor) indicate the proper space for the dirty equipment. A designated cleaning area (approximately 3’x 2’) was labeled and stocked with the appropriate

supplies. Tape on the floor in the Clean Equipment room designates the proper location and number of clean equipment available. Lead Charge Nurses determined the best place in the clean and dirty utility rooms. The configuration varies according to the building layout of each division. The cleaning supplies are maintained by the unit secretary and housekeeping staff.



**After:** Used Equipment is Cleaned in Soiled Utility Rooms on Nursing Division



**After:** Clean Equipment Placed in Storage Ready for Use

Since introducing the process throughout Barnes-Jewish, the wait time for equipment has improved considerably. The time to get an IV pump ranged from 40 minutes to 4 hours, 36 minutes (with a mean of 2 hours, 7 minutes). With the new par levels, the wait time is completely eliminated. In addition, the rate of lost equipment dropped almost in half (from 12% to 6.9%).

The concept of decentralizing equipment cleaning required employees to build trust. The new process was implemented on one volunteer division as a two-week trial. It was so successful the division did not want the trial to end and several divisions heard positive results and wanted to be the next division selected.

The new process has now been in place for the entire 1,200 bed hospital for almost two years. Hill-Rom has expanded the program to include all equipment they manage including: bedside commodes, sequential compressive devices, walkers, bedchecks, portable suction and bariatric equipment.

This project empowered multiple disciplines to work together and partner with an outside supplier to create the best possible system for all. The results demonstrate how even a “low-tech” solution with minimal capital expense can generate sustainable improvements in service delivery and tremendous gains in staff satisfaction. As one nurse described it, the project was a true gift to nurses; the best process improvement she had seen in 30 years!