

Reducing Caregiver Injuries with Motorized Equipment Transport

Brian Loepky, RN, CCRN

Northwest Kidney Centers in Seattle, Washington is the world's first dialysis organization. It currently provides 250,000 dialysis treatment procedures annually to 1,600 patients at its freestanding centers and at homes. Its Hospital Services Group also provides an additional 1,100 dialysis treatments each month to patients at ten local healthcare institutions. Over the past four years, Hospital Services Group has been using motorized dialysis carts to successfully reduce caregiver injuries and to improve the efficiency of patient care.

Established Procedure

Unlike dedicated dialysis centers, the healthcare institutions served by the Hospital Services Group had different process requirements; some of their dialysis patients were temporarily or permanently immobilized in areas of the hospital (i.e. ICU or telemetry). Since the patient could not go to the dialysis equipment, the dialysis equipment had to go to the patient. Before 2012 this was accomplished manually. Hospital staff members were tasked with moving two pieces of dialysis equipment to the patient. This included a portable

dialysis unit and a reverse osmosis (RO) unit providing the necessary water supply for the dialysis function, a total weight of 350 pounds. Each cart was pushed or pulled separately to the location.

This routine had operational and clinical downsides for patients, staff, and administrators

- Manually pushing or pulling a heavy cart resulted in documented staff injuries and downtime
- The time spent pushing or pulling two carts was operationally inefficient, negatively impacting both staff and patients
- These clinical and operational situations had significant financial implications

The director of Hospital Services Group began exploring alternatives that would create a safer work environment, improve patient outcomes, and increase efficiency.

Investigation and Ergonomic Risk Assessment

Northwest Kidney Centers called upon the engineering services of an established provider of transport carts to help them analyze the situation in detail. With the nursing staff as the primary focus, a collaborative team began by observing and documenting the actual transport process. They discovered that the transport task frequently required travel across carpets, up ramps, and over elevator thresholds. Steering control had to be maintained in straight runs and around corners, and there were frequent stop and start requirements. Employees used awkward body mechanics such as twisting and turning to move, control, and brake the equipment. Physical stress levels increased when the cart wheels were not aligned, when it was necessary to move in a wide-turning arc, when pushing up a carpeted ramp, and when an abrupt stop was necessary. The investigation also documented that the average round trip distance was 1,600 feet, the average total time expended was 15 to 20 minutes, and the hospital employee typically performed this task several times each week.



The team then consulted the respected Snook Tables¹ to identify push and pull stress limits acceptable to the targeted nursing staff previously identified as having the strength and agility of 75% of the female population. In this case, it was determined that manually pushing a heavy cart with multiple impediments required physical exertion that exceeded all recommended safety levels. Stress was increased even more when an employee was required to perform the task several times per day.

Motorized Solution

The team believed that a motorized platform could be a viable solution. They determined an existing motorized endoscopy platform could be re-engineered to meet dialysis transport needs. The result was a trailer mechanism that both clinical components - the dialysis unit and the reverse osmosis unit - are linked together.

The motorized device is driven, rather than pushed or pulled, to a location with both components arriving simultaneously. Once in the patient's room, the two components can be unlinked, separated, and positioned as needed, giving the clinician exceptional flexibility of use. Having the two components on separate wheeled platforms allowed ease of replacement should there be equipment malfunction.

Initial Results

Beginning in 2012, Northwest Kidney Centers deployed 53 motorized platforms simultaneously in 10 local hospitals. Each staff member received education on the operation of the carts. They also had to return demonstrate operation of the device which included straight-line maneuvering, short radius turns, stopping, reverse movement, and hitch operation prior to operation in the clinical environment. Initial results indicate that these platforms successfully addressed the key issues: reducing caregiver injury and achieving greater efficiency.



Issue One | Staff Injury

The push and pull injuries suffered by the hospitals' caregivers was consistent with recent data gathered by the Bureau of Labor Statistics. In 2011, United States hospitals reported over 58,000 work-related illnesses and injuries that caused employee downtime. That is equivalent to six to eight work-related injuries and illnesses for every 100 full-time employees, making healthcare employees higher risk for injury than construction workers. For that same year, United States hospitals reported 16,680 cases where employees were absent from work due to musculoskeletal injury. Data collected by the Bureau of Labor Statistics indicates that 48 % of injury-related downtime is caused by over-exertion or bodily reaction. Eight out of 10 nurses state they are frequently work with musculoskeletal pain.² *Since the deployment of the motorized platforms, there has not been one hospital staff member injured during the transport of portable dialysis equipment.*

Issue Two | Efficiency

Cutting the number of trips in half reduced manpower requirements by 50%. At 1,100 round trips each month, eliminating the second staff member garnered the 10 hospitals a total manpower savings ranging from 360 to 550 hours. This outcome freed up staff to perform other meaningful duties. Greater operational efficiency also resulted in a positive clinical outcome; providing more rapid treatment to patients in urgent need of dialysis.

Financial Implications

Hospital-based dialysis programs face significant financial challenges in today's healthcare environment. By utilizing a motorized cart, two pieces of equipment were moved simultaneously, reducing the number of trips to and from the storeroom. The motorized system also provided a consistent travel time per foot of distance covered. This resulted in a reduced time for transport, thus reduced labor costs. Further cost savings were seen in reduction of injury claims and, in return, staff replacement; in many, cases resulting in utilization of overtime.

What could not be directly measured included positive staff satisfaction. Knowing your employer is doing the "right thing" to protect staff from ergonomic injuries by providing tools to assist, results in a positive outcome to both the employee and employer.

References

¹ https://libertymmhtables.libertymutual.com/CM_LMTablesWeb/pdf/LibertyMutualTables.pdf

² https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf

Brian Loepky, RN, CCRN was director of hospital services for 25 years at Northwest Kidney Centers in Seattle, Washington.