



Products to Enhance Productivity

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The HoverMatt System for Patient Transfer

Enhancing Productivity, Efficiency, and Safety



Jean Barry, PhD, RN

In this department, Dr Jean Barry showcases a variety of products and information to assist nurse executives and managers in enhancing their productivity and that of their nursing staff. Manufacturers of new products that enhance productivity are encouraged to email Dr Barry. In addition, nursing executives, managers, consultants, and experts in the field of productivity enhancement are invited to submit their thoughts on and strategies in the use of these types of products. Of particular interest is how these products have increased individual and organizational efficiency. Please contact Dr Barry at barryjea@gvsu.edu.

The vendors and products showcased in this department were selected by the department editor, Dr Barry, and do not indicate endorsement by The Journal of Nursing Administration or its publisher.

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Lifting and transferring patients safely has become a major quality and efficiency issue in the hospital and nursing home industry. The nursing profession has the highest rate of worker compensation claims compared with any other occupation or industry.¹ Back injury tends to be the most common complaint; prevalence rates for back injuries range between 30% and 60%.² It is estimated that, annually, 12% of nurses leave the profession because of chronic back pain,¹ and more than 52% of nurses report chronic back pain.³ This high rate of injury can lead to other adverse organizational outcomes such as increased absenteeism and lost work time, increased turnover, increased operational expenses, and additional challenges in the recruitment, especially of older nurses, and retention of nursing staff.

The risks to patients related to manual handling (ie, lifting, transferring, and repositioning) must also be considered. Skin shearing secondary to friction, especially in older people, has been documented as a potential adverse outcome of lifting and

transferring.^{4,5} Patients can be frightened and insecure moving from one surface to another. Sometimes, this fear can lead to flailing of the arms and legs, which can lead to bruising and skin shearing. In addition, when transferring or lifting an obese patient, additional staff must usually be mobilized. An obese patient may experience a perceived loss of dignity and embarrassment when being moved because of the increased need for staff and the overall difficulties in accomplishing lifting and transferring.

Eliminating Manual Handling of Patients

Eliminating manual patient handling has been identified by both the American Nurses Association and the Occupational Safety and Health Administration as a critical issue.^{6,7} Their recommendations to eliminate manual handling rest on the assumption that the use of assistive equipment and devices will reduce the risk of injury. There is some evidence that suggests that the use of such equipment and devices and the use of lift teams do reduce this



risk. Trinkoff² reported that nurses in agencies that had lift teams were half as likely to sustain a back injury compared with those in agencies without lift teams. In addition, these researchers found a statistically significant reduction in back injuries when mechanical lift devices were used. Other authorities have advocated for the elimination of manual lifting and the use of mechanical lift devices.⁷⁻⁹

The initial and sustained force needed to move a 415-lb volunteer from a bed to a cart was measured in one study.¹⁰ Force is defined as the amount of physical effort required to perform a task (such as heavy lifting) or to maintain control of equipment. These measurements were collected for various transfer methods, including a cloth draw sheet, plastic sheets and slides, nylon sheets with sealed-in silicon, and a mattress that inflated via a blower with air then escaping via holes on the underside of the mattress. When using the cloth draw sheet, the initial and sustained force was 143 ft-lb. When using an inflatable mattress that allowed air to exit through underside holes, the foot-pounds needed for initial and sustained forces were mid 40 and low 30 ft-lb, respectively. Other methods of transfer (plastic slide sheets and boards, silicon-sealed nylon sheets) also showed reductions in the force needed to transfer a patient from a bed to a cart. These values ranged between the high 70s to high 90s ft-lb for initial force and high 40s to mid 70s ft-lb for sustained force. The inflatable-mattress method of patient transfer showed the greatest decrease in the amount

of force to transfer a patient from bed to cart.

Legislation

In response to the degree of risk to employees and patients that is associated with lifting, transferring, and repositioning, the state of Texas enacted a safe lifting law, effective January 2006.¹¹ This law requires hospitals and nursing homes to develop and adopt policies and procedures for the safe handling of patients that "control the risk of injury to patients and nurses associated with the lifting, transferring, repositioning, or movement of a patient."¹²

In this month's department, I am providing information about a lateral transfer and repositioning device manufactured by HoverMatt International. The system includes a transfer mattress and an air supply unit. The mattress is inflated with air from a small motor. As the mattress is inflated, the air is also being forced out of thousands of tiny holes on the underside of the mattress. The escaping air acts as a lubricant, reducing the friction between the patient and the transfer surface. The system requires 45 lb of peak force and 5 lb of sustained force when moving a 210-lb volunteer.¹³

The HoverMatt Air Transfer Mattress

The HoverMatt mattress inflates in 5 to 7 seconds. Given this short inflation time and the reduction in friction, transfers can be performed by less staff and in less time. The potential to increase staff productivity and reduce patient and staff injuries exists.

Nurses returning to work after an injury may be able and more willing to move their patients with the use of the mechanical lift equipment. As noted, research has suggested that with the use of this type of equipment, staff members are less likely to injure themselves.

The HoverMatt has the potential to improve productivity in many areas of a hospital. For instance, in the operating room (OR), postsurgery turnaround time can be improved with the air transfer equipment. The OR table is prepared with the HoverMatt. After the procedure, it is only necessary to attach the air supply unit, inflate the mattress, and transfer the patient off the OR table. Less time is wasted trying to mobilize a team of people to move unconscious patients from the OR table to a cart. Given this, more efficient running of the OR schedule is possible, with less delays in start times for cases.

If an organization decides to carry out a facility-wide implementation using this particular mechanical lift equipment, the HoverMatt company recommends that the transfer mattress be assigned to patients meeting certain weight and mobility criteria upon admittance to the hospital. The mattress then remains underneath the patients for their entire hospital stay. No lateral transfers or repositioning is executed without the use of the equipment. The inflation motor is designed as such that it can be attached to a bed or stretcher for transport with the patient. However, some hospitals have chosen to have the air supply motors stocked in procedural departments. If patients arrive on the mattress,



Table 1. Crouse Hospital's HoverMatt Implementation Information

Indicator	Data
Daily census	231
HoverMatt's in use on a daily basis	130
Program cost	US\$376,000*
Calendar year 2002 worker compensation claims (patient handling injuries most likely attributed to lateral transfer and repositioning tasks)	US\$585,000 Monthly average: US\$48,750
Claims related to back injuries incurred while using the HoverMatt from January 2003 to September 2005	0

*Return on the investment reached within 8 months.
Reprinted with permission from Crouse Hospital, Syracuse, NY.

the department can easily inflate the mattress.

Transport teams may also be able to perform their jobs more efficiently with the use of the HoverMatt. Patient transfers from bed to stretcher can be accomplished with less staff and in less time. With quicker transport from one department to another, staff productivity in all patient care departments would have the potential to improve.

HoverTech International Hospital Wide Initiative

If a hospital or nursing home decides to invest in the HoverMatt system, the company implements the HoverTech International's Guaranteed Injury Reduction Safety Program. This program includes a facility-wide assessment, departmental analysis, and review of Occupational Safety and Health Administration logs and other incident/accident reports. This information is gathered to design a program specific to the hospital. Once an agreement is reached, the protocols, procedures, and training are implemented. After this, the equip-

ment is installed. Using historical workers' compensation costs from the facility as benchmarks, HoverTech International guarantees a return of investment equal or higher than the cost of the program.

Crouse Hospital Implementation

Crouse Hospital, a medium-sized hospital in Syracuse, NY, implemented the HoverMatt hospital-wide safety program in January 2003. The total cost for the program was US\$376,000 (Table 1). I spoke with the Crouse Hospital's director of educational services and coordinator of the HoverMatt project, Luana Reeves, BS, RN. She states that the staff continues to be highly satisfied with the HoverMatt system, and overall efficiency in the transport of patients has been enhanced. Ms Reeves verified that after implementation, there have been zero worker compensation claims related to lateral transfers of patients when the HoverMatt is used. Before this implementation, back injury claims specifically related to lateral transfers and repositioning ran, on average, at US\$48,750 per month.

According to Ms Reeves, patient safety and comfort have been enhanced. During a transfer using the HoverMatt, patients do not come into contact with bedrails so that there is little danger of bruising or skin shearing on the extremities or buttocks. She also believes that patient dignity has been enhanced because obese patients no longer need 6 to 10 personnel for their transfers to be accomplished.

The implementation of mechanical lifting equipment has the potential to significantly improve staff productivity and efficiency and staff and patient safety in a hospital. There is evidence that using lateral transfer mechanical devices and using the HoverMatt, specifically, can address these issues that nursing executives must face on a daily basis. Reduced back injuries, lost work days, and lower worker's compensation costs are results noted in the research and the hospital cited in this column. These results contribute to the increased available funds for the continuous improvement of the quality of the work environment and the quality of care delivered.

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