Zero Lift Programs in Small Rural Hospitals in Washington State
Reducing Back Injuries Among Health Care Workers

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RESEARCH ABSTRACT

In Washington State, health care workers have the highest rate of compensable back injuries. Washington Hospital Services, a self-insured workers’ compensation program, implemented a zero lift program in 31 of its 38 hospitals. Zero lift was defined as replacing manual lifting, transferring, and re-positioning of patients with mechanical lifting or use of other patient assist devices. This program included two trusts, two pools of hospitals that self-insure workers’ compensation. The pools are governed by elected boards of trustees from the pool memberships and regulated by the State Department of Labor and Industries. This pretest–posttest descriptive study compared patient-handling injury data prior to program implementation with those after program implementation. Patient-handling injury claims decreased by 43% in the participating hospitals from 2000 to 2004 (i.e., from 3.51 to 2.23). The time lost frequency rate decreased by 50% (i.e., from 1.91 to 1.03).

In Washington State, health care workers have the highest compensable back injury rate (Silverstein, 2005). State-funded and self-insured hospitals and nursing homes have higher rates of compensable neck, back, and upper extremity disorders than other industries (Silverstein, 2005). Registered nurses, licensed practical nurses, and nursing assistants submit the majority of back claims in Washington State health care facilities. Hospitals and nursing homes in the state report non-fatal injury rates of 11.6 and 10.6 per 100 full-time equivalents (FTEs), respectively. One in 10 employees has an injury, the majority being back injuries, triggered by patient-handling activities (Bureau of Labor Statistics, 2005).

CAUSES OF BACK INJURIES AMONG HEALTH CARE WORKERS

Manual lifting and transferring of patients causes increasing numbers of back injuries among health care workers (Charney, 1998). A biomechanical study indicated most, if not all, manual lifting, transferring, and re-positioning of patients places health care workers at a 76% risk of injury (Marras, 1999). Another study reported nurses manually lift an average of 1.8 tons per shift (Kate, 1997). Nurses spend 20% to 30% of their time bent forward with their trunk twisted during patient-care activities, adding pressure to the disks in the back (Nelson & Fragala, 2005). Nurses in Washington State are, on average, 46 years old. Older, as compared with younger, nurses are more likely to have neck, back, and foot injuries and thus reduced ability to lift patients (Buerhaus, 2002).

UNIQUE CHALLENGES FOR RURAL HOSPITALS AND NURSING HOMES

The nursing shortage is impacting injury rates in both rural and urban hospitals. Empirical evidence exists indicating back injuries among nurses are associated with staffing levels (Wunderlich, Soan, & Davis, 1996). Rural hospitals compete with urban hospitals when recruiting staff. The difference in salary between rural and urban hospitals can be as much as $20,000 per year, leaving ru-
Applying Research to Practice

Replacing manual lifting with mechanical lifting through implementation of a zero lift program will reduce back injuries among health care workers and patients’ risk of being dropped during transfers. Manual lifting of patients exposes health care workers to excessive loads and places them at a 76% risk of injury. Rural hospitals face budgetary challenges when implementing zero lift programs impacting funding, training, and staff recruitment. Patient-handling injury claims decreased by 43% among these rural hospitals implementing zero lift programs.

Rural hospitals at a disadvantage when recruiting or replacing nursing personnel (Ahmed & Graf, 2003). Forty-six percent of rural hospitals in Washington State reported diversion status, not accepting new patients because of a nurse shortage (Skillman, 2001). According to a Joint Commission on Accreditation of Healthcare Organizations study of 1,609 rural and urban hospitals nationwide, the nursing shortage was associated with a 24% patient mortality rate and had as one cause the “physical demands of the job” (Joint Commission on Accreditation of Healthcare Organizations, 2002). Training release time for registered nurses and nursing aides is a challenge in rural hospitals because fewer staff are available to maintain coverage.

Small rural hospitals have difficulty complying with safety practices. They have small budgets restricting their capabilities in several areas. Rural hospitals cannot afford full-time professional safety officers and have limited budgets for employee safety training programs and safety equipment. Because rural hospitals generally do not have separate budgets for employee safety programs, such programs are in financial competition with other programs.

Architectural designs and aging of rural hospitals can significantly impact patient handling. Many facilities have bathrooms with minimal square footage, preventing mechanical equipment from being used. X-ray tables in some diagnostic imaging departments cannot be adjusted for compatibility with mechanical lifting equipment. Doors of patient rooms are not wide enough for bariatric patients and bathrooms were not designed for their size or weight. Storing equipment is difficult in smaller buildings.

METHOD

A pretest–posttest descriptive study design was used to measure the effect of implementing a zero lift program in participating hospitals within a workers’ compensation group in Washington State. Patient-handling back injury rate categories from 1999, including frequency, time lost (severity), total incurred loss per claim, and health care only, were used as baseline data and compared with those for 2004 for 31 hospitals. The year 1999 was chosen because the zero lift program was implemented in the facilities beginning in 2000.

A zero lift hospital had at least some mechanical equipment; all pertinent direct-care staff trained regarding policy and equipment; written and distributed policy and procedures defining the facility as a non–manual lift facility; and a patient screening process. The facilities had participated an average of 2 years (range = 1 to 4). Hospital size ranged from 20 to 200 beds. Some also had nursing homes attached, which are included in the data. All served rural communities in Washington State.

Injury rates were determined using the Occupational Safety and Health Administration formula—number of injuries × 200,000 ÷ hours worked—with results tabulated as number of injuries per 100 FTEs. All hours worked were calculated from each participating hospital’s accounting department and injuries were determined from reports submitted to the trusts. Cost per claim analysis was calculated for the program based on both disability and health care dollars paid.

The Washington Hospital Services workers’ compensation program has 38 rural hospitals in its workers’ compensation trust funds. Prior to implementation of the program, researchers analyzed data from the two trusts and determined that 3.88 back injuries per 100 FTEs were due to patient handling. The average incurred cost per claim was $6,510, which was approximately 35% of all claims. In 2000, the zero lift program was initiated to reduce the frequency and severity of back injuries. Zero lift programs have been successful nationally in reducing back injury rates among health care workers (Fragala, 2003). Of the 38 hospitals, 31 are currently using the zero lift program.

The participating hospitals signed a zero lift agreement with the trusts obligating them to replace manual lifting with mechanical lifting (as defined); purchase patient assist devices based on daily patient census and inventory; write a policy and procedure supporting mechanization of lifting, transferring, and re-positioning patients; mandate the use of equipment; participate in training provided by the safety officers in the program; initiate a program of patient and family education regarding patient lifting equipment and its use; convene a zero lift committee to oversee the implementation process; and perform a “root cause analysis” for each lost-time injury after program implementation to assess the injury and remove possible causes. The hospitals were also requested, as part of the agreement, to create a patient screening procedure. The program provided the tools and forms for all facets of the zero lift program, including a simplified root cause post-injury analysis form. The patient intake screening procedure was designed for use by intake nurses, physical therapists, or both to determine the ambulatory level of new patients. Ambulatory level became part of patients’ charts to direct hospital personnel regarding which lifting device to use, if needed.

Equipment “vendor fairs” were organized for the participating hospitals, allowing patient-care staff “hands-on” testing and analyzing of various equipment designs. Vertical lifts, sit-to-stand lifts, lateral transfer stretchers,
re-positioning sheets, car lifts, toilet and shower lifts, operating room patient transfer equipment, and supporting equipment such as slings were shown to and tested by front-line staff.

Professional safety consultants who assisted with all facets of the program were provided to the hospitals. These consultants worked closely with the hospitals as they began their program. Hospitals received training program models, assistance with data collection, templates for policies and procedures, resources for equipment vendors, and an evaluation tool to assess the program’s functionality. The program organized meetings to promote zero lift programs twice a year, encouraging members to discuss implementation problems, equipment costs, and other issues.

Zero lift committees were formed at the hospitals and responsible for implementing the various stages of the program. These committees were multidisciplinary, including front-line nursing staff, nursing administration staff, safety committee members, physical therapists (if available), and purchasing department representatives. The committees chose equipment, finalized policy and procedures, approved patient screening models, created training schedules, and solved problems.

**RESULTS**

Patient-handling injury claims were reviewed in all categories, including time lost injuries, frequency of injuries, total loss per claim, and health care cost per claim. The greatest reductions were seen in frequency rate and time lost frequency rate. All showed statistically significant reductions that were attributed to implementation of the zero lift program (Table):

- Patient-handling injury claims had decreased by 43%, from a frequency rate of 3.88 per 100 FTEs in 1999 to 2.23 per 100 FTEs in 2004.
- Time lost frequency rates had decreased by 50%, from 1.91 per 100 FTEs in 1999 to 1.03 per 100 FTEs in 2004.
- Health care only claims had decreased by 41%, from 1.97 per 100 FTEs in 1999 to 1.2 per 100 FTEs in 2004.
- Total incurred loss per claim had decreased by 24%, from $6,510 in 1999 to $4,991 in 2004.

**LIMITATIONS**

Challenges existed in implementing the zero lift program in the rural hospitals. Initial investment dollars were not easily allocated in some hospitals. In some cases, the program was initiated with less equipment than recommended and later augmented when the funds were available, usually in the next fiscal year. Turnover rates in the small rural hospitals affected the quality of the program, in some cases delaying more positive results and increasing training pressures. Turnover rates necessitated retraining and occasionally interrupted a more contiguous program flow. Policy and procedures regarding zero lift varied between hospitals. Despite some standardization, some hospitals refused to mandate the program, keeping the language in the policy more voluntary. Hospitals that mandated use of the equipment had better data. Screening models for patient ambulatory status also differed among hospitals. Although agreement existed on the need for a screening process, the models were not standardized. Compliance with the root cause post-injury analysis required by the program was a challenge during the first year but improved during the study.

Although the zero lift model was implemented similarly in each hospital, following a philosophical format of replacing manual lifting and moving of patients with mechanization, each hospital put its individual stamp on the model. For example, each hospital had its own way of disciplining an employee who did not follow the zero lift procedure, lifted a patient manually, and experienced an injury. Each hospital chose its own equipment vendors and different types of patient-handling equipment.

**DISCUSSION**

The zero lift program has reduced patient-handling injuries in the participating hospitals. Both frequency and severity of injuries were reduced by almost half after program implementation, and per claim costs for patient-handling injuries decreased by 24%. The participating

<table>
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<tr>
<th>Frequency rate per 100 FTEs</th>
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<tbody>
<tr>
<td>Time lost frequency rate per 100 FTEs</td>
<td>1.91</td>
<td>1.64</td>
<td>1.6</td>
<td>1.61</td>
<td>1.28</td>
<td>1.03</td>
</tr>
<tr>
<td>Health care only frequency rate per 100 FTEs</td>
<td>1.97</td>
<td>1.87</td>
<td>1.78</td>
<td>1.78</td>
<td>1.39</td>
<td>1.2</td>
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<tr>
<td>Average total incurred loss per claim</td>
<td>$6,510</td>
<td>$7,020</td>
<td>$5,868</td>
<td>$4,397</td>
<td>$6,540</td>
<td>$4,991</td>
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*FTEs = full-time equivalents.*
hospitals’ administrations worked diligently to fund and support the program after signing the zero lift agreement, despite some having negative operating margins. Equipment purchased included vertical lifts, lateral transfer stretchers, sit-to-stand lifts, ceiling lifts, and non-friction transfer sheets for re-positioning. Money spent on equipment varied by hospital size and budget (e.g., a 48-bed facility spent $26,000 on start-up equipment, a 200-bed facility spent $100,000 for zero lift equipment during 2 years, and a 75-bed facility spent $40,000 on start-up equipment). Therefore, a standard cost curve is not possible. The cost per bed for zero lift equipment was approximately $500.

CONCLUSION

The zero lift program in small rural hospitals in the Washington Hospital Services workers’ compensation program has led to statistically significant reductions in patient-handling injury claims. Prior to program implementation, patient-handling injury claims were approximately 35% of the total incurred claims cost for the system.

The high incidence of back injuries among health care workers in rural hospitals is an obstacle to delivering quality health care, as recruiting replacement personnel is more difficult in this setting. Rural hospitals also have their share of bariatric patients and thus need to mechanize care. Zero lift was also introduced as having a crossover effect for patient safety (DeCastro, 2005). For patients, mechanical lifting results in fewer skin tears, fewer falls during transfers, less injury from manual manipulation, greater dignity, and less pain.

Replacing manual lifting and re-positioning with mechanization, as stipulated in the zero lift program, posed unique challenges in the rural setting. These obstacles were gradually overcome with leadership within each facility.

In October 2005, Washington Hospital Services workers’ compensation program trained staff members from the hospitals to be patient-handling specialists. They are the “experts” in their hospitals regarding patient handling and are accountable for the program’s success.

REFERENCES


