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# The Quest to Prevent Employee Injury: Implementation of a Lift Team

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### Abstract

A lift team was trialed at an urban medical center in the Pacific Northwest to reduce employee injuries. The lift team consisted of a lift tech and a nursing assistant who were both trained in lifting techniques. The trial lasted one year. Pre-post data on employee injuries and day vs. night injuries during lift team implementation are described. Results do not show the same reduction in employee injuries described by previous authors. Possible explanations related to the usage of the lift teams and policy developments are explored.

## Introduction and Overview

In 2006, the Bureau of Labor Statistics (BLS) reported 1,183,500 non-fatal occupational injuries involving lost time from work. Non-licensed health care workers were ranked third in the highest number of work days missed due to injuries, with an incidence rate of 526 workers injured per 10,000 workers (BLS, 2008a). In this same year employee lifting injuries represented a large number of the total claims for health care workers. Tasks such as lifting, turning, and ambulating patients are activities associated with musculoskeletal strains and back injuries (MSDs) accounting for more than 30% of total lost time cases (Caska, Patnode, & Clickner, 1998; Haiduven, 2003). Nurse aides, orderlies, and attendants suffered 27,590 MSDs, being surpassed only by professions encompassing heavy physical labor – miscellaneous laborers, freight, stock and material movers. In the same year Registered Nurses (RNs) reported 9,200 MSDs, ranking them number five compared to MSDs suffered by other job categories (BLS, 2008b). Nursing personnel are thus one of the highest risk groups for sustaining musculoskeletal injuries.

Caska et. al, (1998), describe three primary reasons for employee injuries in health care workers: organizational factors, environmental factors, and personal factors. Organizational factors may include lack of time, insufficient lifting equipment, unavailability of additional personnel to assist with lifting/moving tasks, and pressure to get the job done. These organizational factors are heightened by the current nursing shortage. The latest projections from Health Resources and Services Administration (HRSA) show health care facilities are operating with vacancy rates of 8.5 % throughout the United States with a significant upcoming increase in predicted shortages within all 50 states (HRSA, 2006). Environmental factors include confined space and inaccessible

or inoperable lifting equipment. The most common personal factor associated with a back injury is a previous back strain or injury (Caska et al., 1998). However, other factors to consider in this category are heavier patients and an aging nursing workforce (Allen, 2008; Collins, Wolf, Bell, & Evanoff, 2004; O'Malley, Roark, Emsley, Ondercin, & Donaldson, 2006). Two of every three adults are overweight and it is estimated that a quarter of this overweight population is actually obese (Humphreys, 2007). The average age of a nurse in 2004 was 46.8 years, with 41% aged 50 or older (up from 33% in 2000). As nurses age, many are not physically able to offer adequate aid in patient handling (Harper & Pena, 1994).

### Philosophy of a Lift Team

Some authors view patient lifting as a specialized skill that should not be considered “routine” and performed by all nursing personnel. Charney (1997) states “...lifting patients is considered a specialized skill performed by expert professional patient movers who have been thoroughly trained in the latest techniques, rather than a hazardous random task required by busy nurses” (pg 300). This philosophy has led some health care organizations to implement specially trained “lift teams” to move patients. Several authors have reported substantial reduction in employee injuries as a result of lift team implementation (Caska et al., 1998; Caska, Patnode, & Clickner, 2000); (Charney, 1997; Charney & Gasterlum, 2001; Charney, Zimmerman, & Walara, 1991; Davis, 2001; Guthrie et al., 2004; Hefti et al., 2003; O'Malley et al., 2006).

### Review of literature related to lift teams

The length of time for the lift team trials reported in the literature varied from eight months to six years. Charney (1997) described a multi-institutional study of lift

team implementation showing a 69% reduction in employee lifting injuries. Hefti (2003) also showed a decrease in lost work days and restricted work days pre and post lift team utilization ranging from 57% to 95%. Several authors examined cost savings realized with use of a lift team in terms of reductions in employee injuries and worker compensation claims. Charney (1991) reported one-year savings of \$65,000, a 72% reduction in workers compensation dollars, and Hefti (2003) reported \$45,815 in overall savings. In another one-year study, Charney (2001) reported workers' compensation costs decreased from \$224,000 pre lift team to \$14,000 after lift team implementation. These facilities, like most that reported significant injury reduction, implemented policies forbidding lifting of patients by nurses ("no lift policies") and had lift teams that were available by pagers and answered calls from nursing staff for lifting assistance.

### Study Purpose

An urban medical center in the Pacific Northwest made the decision to implement a lift team to reduce employee injury and increase support to the nursing staff. The medical center partnered with the nursing department at a local university for program evaluation. The purpose of this study was to determine the effect on employee injury rates of the use of a lift team without implementation of a no-lift policy.

### Methods

#### Procedures and subjects

This study was undertaken at a 350+ bed medical center in the Pacific Northwest. The study received approval from the Human Subjects Review Boards of the medical center and the university that evaluated the project.

#### Description of the Lift Team

Two lift teams were formed. Each team consisted of a nurse aide (CAP), and a second lift team member. The facility used a philosophy of ensuring patient needs are always met first. This was the basis for the decision to have one of the lift team members be a certified nurse aide to allow the lift team members to meet basic patient needs such as toileting, fluid intake, or vital signs. All lift team members received training in ergonomics by the medical center physical therapy department and were hired and supervised by the internal transport office.

Four medical/surgical units were selected to use the lift teams. Each team served two units by making rounds and moving patients hourly on each unit. The lift teams began each hour by checking with the charge nurse on the unit to identify patients needing the most assistance with moving. The charge nurse categorized patients from 0-3 using an in-house scale to gauge the immobility of the patients, with a "0" ranking being totally independent in moving, a "1" indicating assistance needed to get out of bed, a "2" indicating assistance from one person to help turn and ambulate the person, and a "3" rating indicating the greatest degree of immobility with a 2 person lift required. Those patients with a score of "3" were automatically visited by the lift team and were helped to turn in bed or mobilize to the chair or bathroom every 2 hours. If time allowed, other patients were assisted to the chair, bathroom, or were turned. In addition, nurses could access the lift team for assistance by calling the main transport dispatch center and having the lift team paged. Each unit had its own lifting equipment readily available on the floor. The lift team was introduced to the staff on the units via staff meetings. Nurses were told the lift team would move patients who were categorized as being the most

immobile. In addition, the nurses were asked to call the lift team for turning and ambulation activities for all patients.

The lift teams operated from February 19, 2007 until December 31, 2007. To allow for a pre-post comparison, pre-data were initially collected from February through December of 2006 but later were expanded to include three full years of pre-data to minimize normal seasonal variations.

Data collected included:

- Acuity, census, and length of stay: Acuity level was collected twice per day on all patients using a tool developed for use by the facility. Acuity was measured on a scale of 1-3 with higher numbers indicating higher acuity. Census was defined as number of patients present at midnight. Census was calculated per unit/floor. Length of stay was the number of days (including partial days) from admission to discharge. Acuity level of patients and census data were collected for the pre-lift team trial and during the year of the lift team trial.
- Nursing time saved: Nursing time saved was assumed to be the amount of time the lift team spent working directly with patients. This was time the nurses would have spent making these moves. This information was collected by the lift team members through diaries that were kept by hand and entered into a spreadsheet each evening. The data were collected by the left team supervisor, and files were sent to the researchers monthly for analysis.
- Lifting injuries and restricted work days RN and CAP: Lifting injuries were defined as any injury that a nurse or CAP reported to have occurred at the time of moving a patient as captured on an OSHA 300 log (<http://www.osha.gov/recordkeeping/new->

osha300form1-1-04.pdf). Data related to employee injuries were collected by the institution, de-identified, and sent to the researchers. RN and CAP lifting injuries were tallied during three time periods: prior to the lift team trial, during lift team trial for hours the lift team worked, and during lift team trial for hours the lift team was not on duty. Restricted work days were defined as time spent either on the home unit with restricted work duties (i.e. no lifting) or time spent on a different unit doing non-direct patient care duties.

### Analysis

Stata software version 10 was used for all analyses (StataCorp, 2007). Mean patient acuity, census, and length of stay for each month were compared for February - December 2006, prior to lift team implementation, and February – December 2007 when the lift team was in place. Means were compared using independent samples t-tests. Due to the small sample size, tests were repeated using the non-parametric Mann-Whitney U test, which uses ranks rather than the actual data values. The same results were seen in both tests.

Employee lifting injuries were analyzed using independent sample t-tests for average monthly injuries during the months prior to implementing the lift teams compared to monthly injuries during months the lift teams were in place. RN injuries were analyzed separately from CAP injuries. A Poisson regression model was fit for the count of RN injuries per month. Poisson models are designed to model outcome data based on discrete counts. Independent variables in the model were patient acuity and census, and an indicator for whether the lift teams were implemented. “Month” was the unit of analysis. Total RN hours worked was included in the model as the exposure



variable, that is, as the amount of exposure reflected in each observation. A goodness-of-fit statistic was calculated after fitting the model to assess whether the Poisson model was appropriate for these data. The average number of days employees were on restricted duty or transferred out of their home units was analyzed using independent samples t-tests.

All analyses included data from March through December of each year. Data from January and February were excluded from the pre-lift team period because the lift team was implemented in late February and as a result, no lift-team data were available from January or February for comparison.

## Results

### Acuity, Census, Length of Stay

Acuity and census, and to a lesser extent length of stay (LOS) can affect staffing levels and the likelihood of employee injuries. The analysis began by looking at whether these factors changed between the pre-trial and lift team periods. Statistical tests showed that the average acuity was significantly higher for 2007 than 2006 and average census per floor was lower in 2007 than in 2006 by an average of 1.5 patients each month.

Average LOS did not differ between 2007 and 2006 (Table 1).

Table 1: Comparison of mean monthly patient acuity, census, and length of stay prior to and during the lift team implementation

	Pre-lift team (2006)			With lift team (2007)			p-value
	N	Mean	Std. dev.	N	Mean	Std. dev.	
Acuity	10	2.75	.147	10	3.01	.038	< .001
Census	10	24.61	.798	10	22.97	.821	< .001
Length of stay (days)	10	4.79	.491	10	4.73	.235	.74

The pre-trial time period in 2006 is not comparable to the lift team trial period in 2007 in terms of acuity and census, and the analyses that are adjusted for these factors should be given the most consideration.

Nursing time saved: The lift teams worked an average of 8-10 hours per day and it was assumed when the project was proposed this might be credited as nursing time saved. However after reviewing staffing patterns, the presence of the lift team did not have an impact on staffing the unit. Nonetheless, one could argue that the patients received higher quality care due to frequent moves and due to nurses having more time to devote to other aspects of patient care.

#### Lifting Injuries

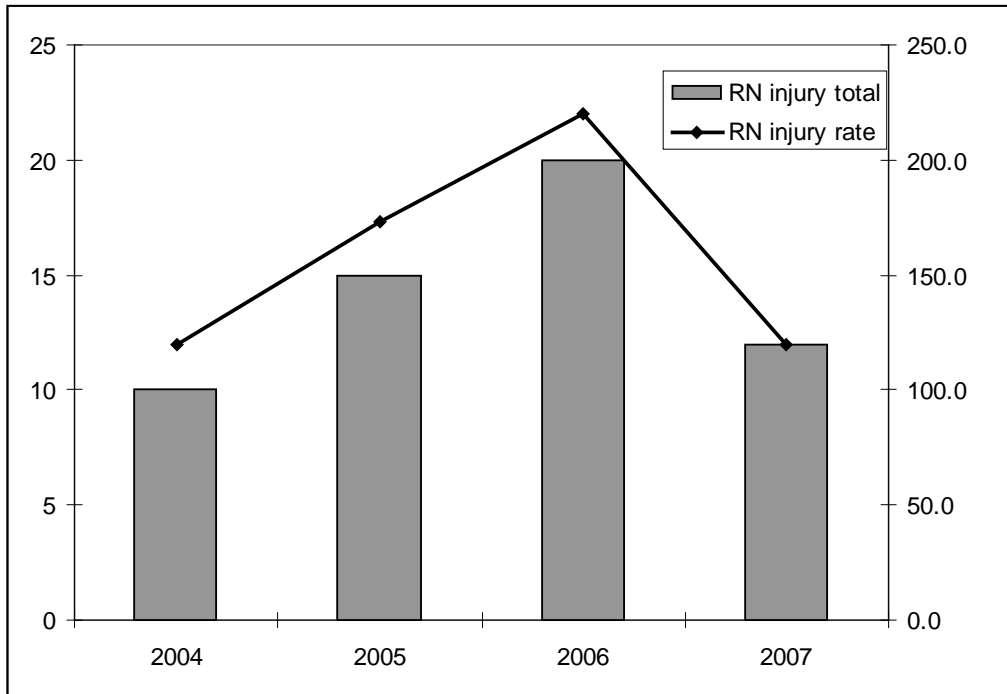
The number and rate of RN injuries varied greatly between 2004 and 2007, increasing from a low of 10 in 2004 to a high of 20 in 2006 and then falling to 12 in 2007 during the lift team implementation (Table 2 and Figure 1).

Table 2: RN injuries

Year	Number of injuries	Injury rate*
2004	12	155.3
2005	19	219.4
2006	25	275.2
2007	17	169.2

\*Calculated using the OSHA 300 Log formula: injury rate = (# of injuries\* 200000)/total hours worked

Figure 1: RN injuries prior to implementation of lift team (2004 – 2006) and during implementation of lift team (2007). All years reflect March – December only



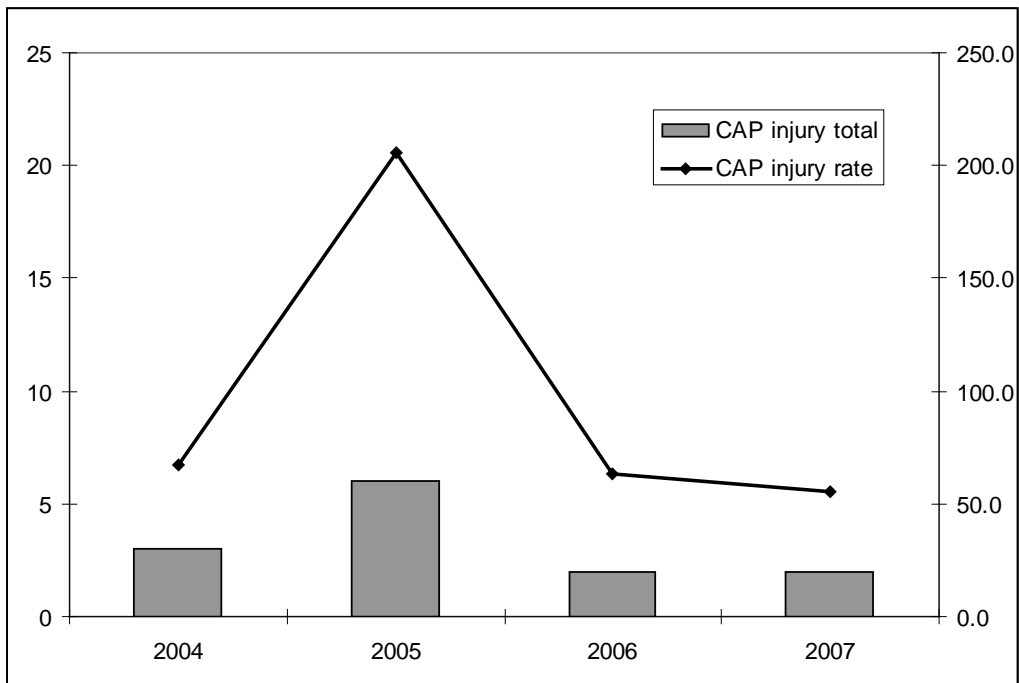
CAP injuries also show a great deal of variability, with a minimum of 3 in 2006 and a maximum of 9 in 2005 (Table 3 and Figure 2).

Table 3: CAP injuries

Year	Number of injuries	Injury rate*
2004	3	67.6
2005	6	205.4
2006	2	63.6
2007	2	55.4

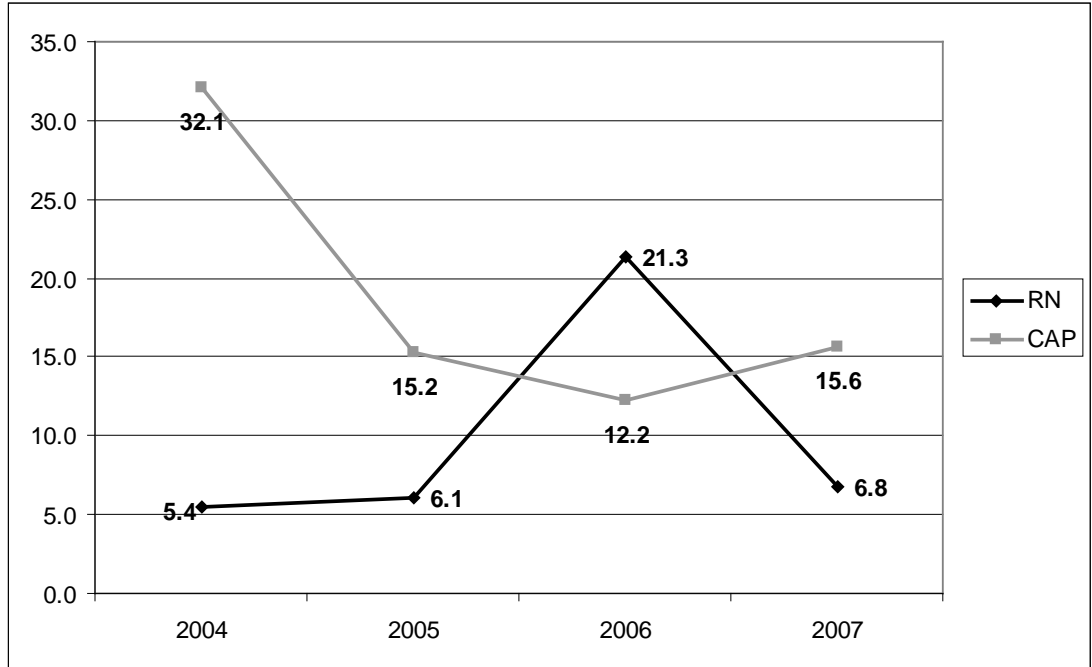
\*Calculated using the OSHA 300 Log formula: injury rate = (# of injuries\* 200000)/total hours worked

Figure 2: CAP injuries prior to implementation of the lift team (2004 – 2006) and during implementation of the lift team (2007). All years include March – December only.



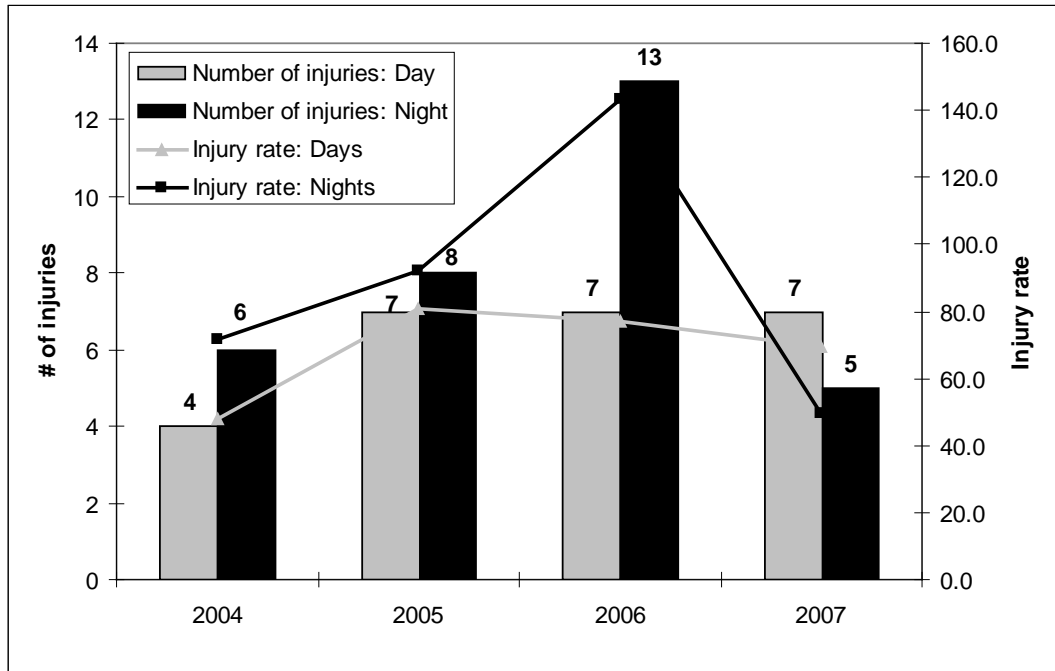
The total number of days employees spent on restricted duty was also assessed for March through December of each year, adjusted for the number of RN and CAP hours worked. For RNs, the rate was lowest in 2004 at 5.4 days per 1000 hours worked. There was a slight increase each year except 2006 when the rate jumped to 21.3. The rate fell to 6.8 during implementation of the lift team, but this was higher than the rates in 2004 or 2005. CAPs show a different pattern, with a rate of 32.1 days per 1000 hours worked in 2004, dropping to 15.2 in 2005. There was a slight increase in restricted days between 2006 and 2007 during the lift team implementation (Figure 3).

Figure 3: Transfer or Restricted Duty Days over 1000 hours worked prior to implementation of the lift team (2004 – 2006) and during implementation of the lift team (2007). All years include March – December only



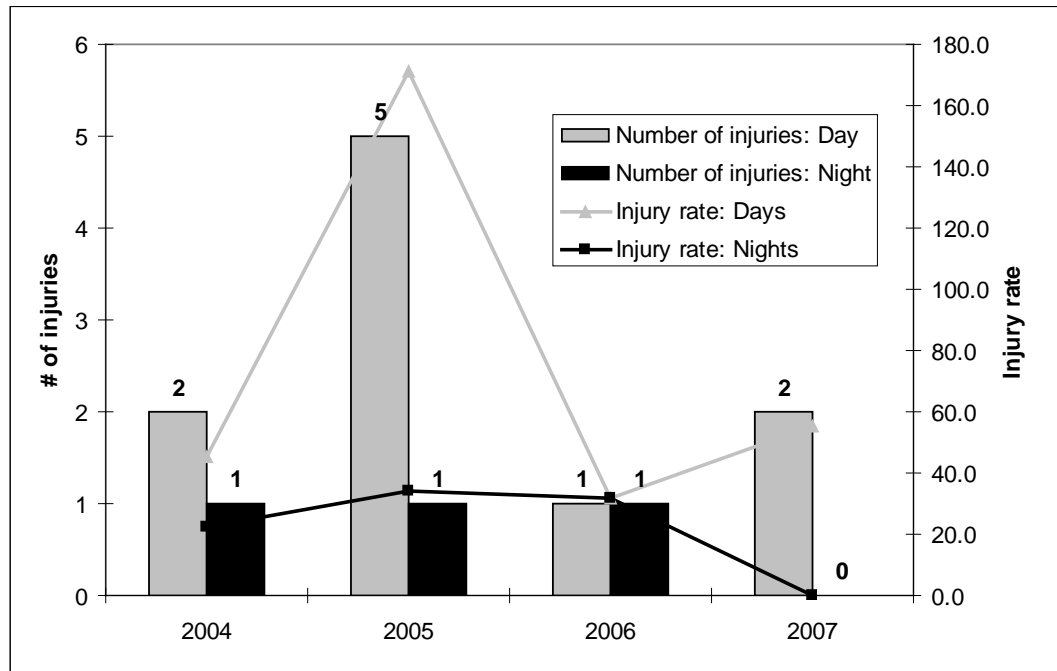
If the lift team was having an effect on injury rates, one would expect to see the highest impact during the daytime hours when the lift team was working. For RNs, injuries were more likely to occur during the night hours than daytime hours in most years. The number of daytime injuries was steady at 7 in both 2006 and 2007. The 2007 pattern of RN injuries follows the 2004 pattern (Figure 4).

Figure 4: RN injuries by day (8:00 a.m. – 6:00 p.m.) or night (6:01 p.m. – 7:59 a.m.) occurrence prior to implementation of the lift team (2004 – 2006) and during implementation of the lift team (2007). All years include March – December only



CAPs, on the other hand, have higher injury rates during the daytime. The number of daytime injuries was fairly steady at 1 – 2 per year in all years except 2005 when 5 daytime injuries occurred (Figure 5).

Figure 5: CAP injuries by day (8:00 a.m. – 6:00 p.m.) or night (6:01 p.m. – 7:59 a.m.) occurrence prior to implementation of the lift team (2004 – 2006) and during implementation of the lift team (2007). All years include March – December only



Poisson regression models were created to assess whether the presence of the lift team affected the number of RN or CAP injuries after adjusting for differences in acuity and census. The outcome variable was the count of injuries per month, and the unit of measurement was month. In the RN injury model, none of the independent variables showed a significant relationship to the number of employee injuries. In the CAP injury model, patient acuity was strongly related to CAP injury, with a doubling of risk of injury for each 0.1 increase in acuity (Incidence rate ratio (IRR) = 2.04, standard error 0.54,  $p = .006$ ). Lift team presence showed a trend toward being protective; the IRR was .21, indicating approximately 80% reduction in risk of injury ( $p = .06$ ). This may indicate that although the number of CAP injuries did not change after implementation of the lift

team, given the higher patient acuity and census perhaps an increase in CAP injuries would have been seen had the lift team not been present.

## Discussion

Results do not indicate strong evidence that the implementation of the lift team reduced the number of employee injuries (RN or assistive personnel) related to patient-handling. While injuries were lower in 2007 during the lift team implementation than in 2006, injuries in 2004 and 2005 were similar to or lower than those seen during the lift-team implementation.

Findings for injuries from this study are not representative of the findings of other authors (Charney, 1997; Hefti, 2003). Previous studies have looked primarily at the year of lift team implementation compared to one previous year. A one year comparison of injuries pre and post in this study would have revealed a similar decline in RN injuries as well as in restricted duty days. It was after more in-depth analysis spanning over four years and controlling for census and acuity that we discovered no significant difference in employee injuries related to the use of the lift team. It is possible that other hospitals implemented lift teams after a period with high rates of employee injuries, and perhaps regression to the mean accounts for the lower employee injury rate after lift team implementation.

Most lift teams in the reviewed literature were available by paging rather than making routine rounds on floors (Charney, 2004). Additionally, most facilities implemented a no lift policy at the time the lift team was introduced (Charney, 1997). Anecdotal evidence obtained from nurses and lift team members indicated the nurses and CAPs just did not wait for the lift team to make rounds or did not want to “bother” the



team. Indeed some nurses actually wanted to hurry and get their patients taken care of before the lift team made rounds. While this is a testament to the desire to deliver high quality care and pride in the care delivered, it may have contributed to more injuries. The facility did not make an attempt to implement “no lift” policies simultaneous to the implementation of the lift team. The addition of a solid policy against lifting patients may have enhanced the chances the lift team would have been utilized.

Formal evaluation and analysis of the level of satisfaction with care of patients and satisfaction with the work environment for staff was not part of the scope of this project. However, anecdotal information indicated the lift team was very popular with staff and patients. Despite the lack of positive outcomes related to employee injuries, anecdotal reports from nursing leader interviews indicated strong support for the model and continuation of the program. The program was left in place. Changes were made to the lift team staffing model requiring flexible schedules depending on patient volumes. Data continues to be collected on musculoskeletal injuries and the relationship to the lift team usage.

#### Practical applications/implications

Thorough analysis of lift team programs is essential. Previous research into the effectiveness of the use of lift teams showed a decrease in the number of employee injuries. The current study revealed no change in employee injuries when adjusted for acuity and census and when compared over a 4-year period of time. When implemented, the institution did not use a “no lift” policy, a decision which could have limited the effectiveness of the lift team. A process monitor to ensure the lift team was being used as envisioned could have strengthened this implementation. For this institution, the

partnership with the university assisted in a thorough analysis. When evaluating the effectiveness of programs, health care facilities should consider partnering with a local university and examining data collected over longer periods of time to ensure sound decision making.

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