A RISK ASSESSMENT OF NURSING PERSONNEL INJURIES OCCURRING WHILE LIFTING, TRANSFERRING OR REPOSITIONING NURSING HOME RESIDENTS

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Abstract

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The primary objective of this research thesis was to identify the root causal factors associated with lost time injuries occurring among nursing personnel in long term care facilities. The critical elements assessed and evaluated include: length of service; time of day injury occurred; task being completed when injury occurred; similar incidents in the past (accident repeaters); type of shift on which injury occurred; number of hours worked the day injury occurred; impact of company policy; availability of mechanical lifts; training on how and when to use mechanical lifts; exercise; stretching; training on safe lifting techniques or good body mechanics; gait belt use; hours per week worked at time of injury; number of residents cared for at time of injury; asking for assistance to lift, transfer, or reposition a resident; and job satisfaction.

Nineteen of thirty-five nursing assistants from three separate long term care facilities in northwestern Pennsylvania responded to twenty-one questions on a nursing assistant questionnaire. Results from each of the questions were used in developing critical elements to be evaluated within the research thesis. The critical elements above have been individually assessed and analyzed through the classification of risk severity and probability. The classification of risk severity and probability extending into a decision matrix is a form of root cause analysis known as risk analysis. The risk assessment process ranked all of the critical elements evaluated into the following three corrective action categories: risk reduction required immediately; written, time-limited waiver by management required; and operation permissible-needs no reduction.

Root causal factors have been identified as those critical elements that had a risk severity and probability outcome requiring either a written, time limited waiver endorsed by management or risk reduction required immediately as the applicable corrective action category. The research revealed the following critical elements to be an indirect failure within the management system and root causal factors associated with nursing assistants injured when lifting, transferring, or repositioning nursing home residents: number of hours worked the day injury occurred; impact of company policy; training on how and when to use a mechanical lift; how long ago training was conducted on mechanical lifts; stretching; gait belt use; hours per week worked at time of injury; job satisfaction; training on safe lifting techniques or good body mechanics; number of residents cared for at time of injury; and asking for assistance to lift, transfer, or reposition a resident.

The research thesis has identified root causal factors and produced recommendations that will enable the implementation of corrective measures necessary to decrease lost-time injuries occurring among nursing personnel working in long term care facilities.

Dedication

This research thesis is dedicated to my wife Terri, whose support and encouragement has been never ending. A special dedication also goes out to my mother and father for raising me with the desire and passion to continue to learn. A final dedication goes out to my children Christian and Jared. "Excellence is the result of caring more than others think is wise; risking more than others think is safe. Dreaming more than others think is practical and expecting more than others think is possible."

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List of Abbreviations

HMO – Health Maintenance Organization

IRP – Injury Review Process

LPN – Licensed Practical Nurse

LWDII – Lost Work Day Injury/Illness

NA – Nursing Assistant

OSHA – Occupational Safety and Health Administration

SST – Site Specific Target

Introduction

Background

On April 19, 1999 the Occupational Safety and Health Administration published an OSHA Notice by and under the authority of Charles N. Jeffress, Assistant Secretary for the Department of Labor. The Subject of the Notice was a "Site Specific Target" (SST) inspection plan. The plan is based on establishment specific employer Lost Work Day Injury/Illness (LWDII) rates obtained from data in calendar year 1997. This SST inspection plan targets those individual work sites with a LWDII rate above 16.0 per 100 full time workers. Among the targeted industries to be inspected from the SST inspection plan, Long Term Care Facilities are included (OSHA, 1999).

The long term care industry has been changing rapidly due to the advent of Health Maintenance Organizations (HMOs) and decreases in Medicare and Medicaid reimbursements to nursing homes. Before the existence of HMOs a patient who was ill could expect to be admitted into a hospital for treatment prior to becoming very ill. Now, the patient's HMO, not necessarily the attending physician, often determines when to admit the patient. This new system has increased the level of patient acuity for those patients that are admitted into hospitals. Therefore, more nursing home residents stay in the nursing home rather than seek treatment in a hospital. Also, decreased Medicare and Medicaid reimbursements to aid the elderly with nursing home expenses a have resulted in the long-term care industry cutting staffing to a minimum level of caregivers. In Pennsylvania, the Department of Health regulates the minimum staffing level, currently 2.7 hours of direct care for each resident in the state of Pennsylvania (PA Bulletin, 1999). To meet the training and experience requirements for becoming a Certified Nursing

Assistant in the state of Pennsylvania and qualify to work in a nursing home one must complete 75 hours of training. No residency or internship experience is required for nursing home workers.

As a result, there has there been an increase in work related back injuries among nursing personnel in nursing homes. Causal factors can be attributed to reduced government funding to long term care facilities, reduced staffing levels, an increase in the elderly population, and reducing the professional level of training required to assist the elderly to that of a certified nursing assistant.

The Emerging Health Risk

Injuries to nursing personnel in the long-term care industry began to increase in the mid and late 1980's. When looking at injuries to nursing personnel Personick (1988) found that nursing and personal care employee sustained 151,000 reportable injuries and illnesses in the United States. This was the sixth highest number reported among all general industry in the United States. The Bureau of Labor Statistics reported that in 1987 nursing and personal care employees had an average injury rate of 13.9 injuries per 100 full-time employees (Bureau of Labor Statistics, 1989). This is much higher than the average of 8.0 injuries per 100 full-time employees for all other industries combined. Considerable literature has been published about the prevalence of low back pain and low back injuries among healthcare facility employees. Two million nurses, nurse's aids, and orderlies in the United States comprise two of the ten occupations with the highest back injury rates (Klein et al., 1984). Klein indicated from workers' compensation data that nurse's aides ranked fifth and licensed practical nurses ninth in the top nine in a list of occupations with the largest ration of claims for back sprains or strains (Zhuang et al.,

1995). Occupations such as miscellaneous laborers, garbage collectors, warehouse workers, and miscellaneous mechanics ranked higher than nursing aides (Zhuang et al., 1995), but Zhuang indicated that back pain experienced by nursing personnel is greater than published statistics indicate. Zhuang notes that the magnitude of the low back pain is often estimated from the workers' compensation data or incident report data and suggests nursing personnel often do not report their low back pain. For instance, 66 percent of the nursing personnel who stated they had occupational low back pain never filed any incident report (Zhuang et al., 1995). An ergonomic evaluation of the nursing assistants' job in a nursing home by Garg et al. (1992) found that on the average, a nursing assistant experienced four episodes of low back pain in the last three years and three out of four episodes of pain were not reported. It is clear that low back pain and injury statistics vary in the available literature. The severity and magnitude of the problem impacts nursing personnel throughout the world. However, it is perceived by most nursing personnel that resident lifting tasks precipitate the occurrence of these low back injuries.

Problem Statement

The purpose of this research is to *"Identify the root causes of lost time injuries occurring among nursing personnel in long term care facilities."* The researcher will attempt to uncover the direct and indirect root causes of nursing personnel injuries working in long term care facilities. The definition's for direct and indirect "root causal factor" are identified below:

- Direct "root causal factor" – Direct causes are the unsafe act or unsafe condition which bring about an injury (i.e. while attempting to assist a nursing home resident to

the bathroom the resident lost her balance and the nursing assistant tried to catch the resident to prevent her from hitting the floor.) This unsafe act resulted in a back injury to the nursing assistant. The direct root cause is the resident lost her balance.

- Indirect "root causal factor" – Indirect causes are the factors which influenced and ultimately result in the direct "root causal factor" (i.e. reduced staffing levels leading to not enough people or time to complete task safely, resident lift equipment training, and management not requiring staff to use gait belts.) Indirect causes are directly related to failures occurring within the management system.

Review of the Literature

Impact of Lost-Time Back Injuries

According to Rienerth (1996) occupational back injuries are the major concern in the healthcare industry. Healthcare facilities and providers seem to accept back injuries and workers' compensation costs as a cost of doing business. With healthcare costs and workers' compensation premiums rising, however, they cannot continue to do so and remain competitive. Recent emphasis by OSHA has helped motivate many of these facilities to focus their efforts on injury prevention rather than claims management, suggesting that an effective back injury prevention process can reduce the potential for these costly injuries. Rienerth (1996) indicated that in Ohio's nursing home and health care facilities the back injury rate is double the statewide average for all industries. This is also the norm in most other states as well. The average direct cost of each lost-time back injury is approximately $25,000, with some claims exceeding $100,000. It was estimated that 75-90% of the lost-time back injuries experienced in nursing homes was the result of patient handling activities.

While it is important to understand the impact of the lost time back injury, it is more important to identify how these injuries are precipitated. The remaining sections within the literature review will study the "critical elements" that precipitate nursing personnel lost time injuries as a result of having to lift, transfer and/or reposition nursing home residents.

Garg (1999) stated that worker's compensation records show more than 73% of the back strain/sprain cases are reportedly triggered by lifting and transferring of nursing home residents. Garg also reported, based on data from three different nursing homes over a three year period, that manual lifting and transferring of patients accounted for 84% of reported injuries, 86% of all lost-time and restricted work day injuries, and 81%-93% of workers' compensation costs. Other studies using questionnaires have reported even higher percentages for patient handling as the primary cause for back pain. As in most cases, manual lifting and transferring of nursing home residents will result in compressive forces of the low back that can lead to a debilitating back injury.

Overtime Work

Eastman Kodak (1999) studied various aspects of how overtime work in a manufacturing environment effects the psychosocial, physical and environmental demands of the job. This research may also be applied to the nursing industry as overtime and physical demands are both common. The psychosocial factors can be explained through the following example. When a person works ten hours a day or more, personal time is minimal, and according to Kodak, recreational time for the family is not as accommodating. Despite increases in pay for working the 10-hour day, employees are

not normally satisfied, nor willing to consistently put these longer hours in. Kodak explained that employees don't mind the extra overtime as much if it occurs infrequently.

The physical and environmental job demands suggest that a job that requires 33 percent of capacity averaged over eight hours could only be sustained on overtime by further reducing the effort level. Jobs that included tasks in the heavy, very heavy, and extremely heavy categories do not lend themselves to extended hours of work without job redesign to reduce the effort.

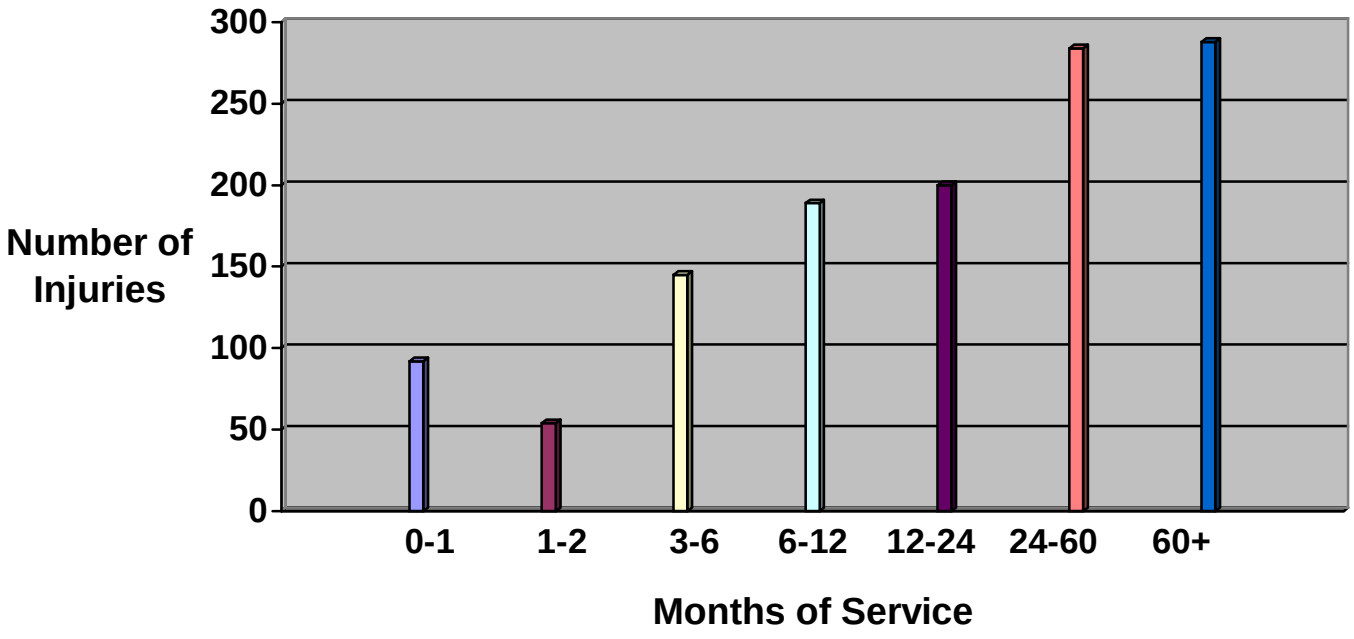
Eastman Kodak explained that the amount of physical and environmental exposures normally calculated to be accepted levels is based on an 8-hour workday and a five-day workweek. Overtime and seven-day work shift schedules may lower the acceptable exposure levels to physical stresses, such as lifting and transferring nursing home residents. However, Eastman Kodak (1999) suggested that many facilities never consider the overtime stress as factor to consider when attempting to improve working conditions or provide adequate protection and rest.

Nursing homes face another challenge with overtime work due to state regulations that govern most nursing homes. In the state of Pennsylvania for example the Department of Health requires that minimum staffing levels in long-term care facilities not go below 2.7 hours of direct care for each nursing home resident. (PA Bulletin, 1999) This number is calculated by taking the total number of nursing home residents and dividing them by the total number of full-time nursing personnel working for a 24-hour period. To calculate this rate the following formula is used: (80 residents / 29 full-time nursing staff members = 2.7 hours of direct care per resident). If and when a nursing staff member does not come in to work or calls off sick the nursing home is at risk of

being penalized by the Pennsylvania Department of Health. If a nurse is not called in to fill the position, then someone usually ends up working a double shift. If the state inspects a nursing home and identifies deficiencies with staffing levels then the nursing home is cited and, if severe enough, can lose its license to operate as a nursing home. Shutdown of the nursing home can occur if a nursing home cannot maintain the required 2.7 hours of direct care necessary per nursing home resident on a daily basis.

Turnover and Months of Service

The average turnover rate within the nursing home industry is very high at 80% (Garg, 1999). The Pennsylvania Healthcare Association (1999) collected data indicating the length of service per total number of incidents within 85 nursing homes throughout Pennsylvania. This data is displayed in Figure 1.



Source: Pennsylvania Healthcare Association, 1999

Figure 1.- Length of service per total number of incidents

Garg (1999) explains that some of the problems contributing to the high turnover rate among nursing assistants are due to the following conditions:

- About 95% of nursing assistants are females employed in jobs with high physical and mental stresses.
- Wage rates are low ($5 - $8 per hour).
- Fringe benefits are few (generally no health insurance and pension plan),
- Often there is a shortage of staff available to fill in when needed.

Garg studied the impact of implementing a "No Manual Lift Program" in a nursing home on turnover. The facility studied was an 85-bed facility. About 55-68 patients needed to be lifted and transferred routinely. The nursing home has a total of 125 employees and 55 are certified nursing assistant. The total number of nursing employees was 76.

The no lift program was started in November 1992. In 1991, the director of nursing and two nursing assistants attended a presentation on reducing injuries in nursing homes by Dr. Garg and were very impressed with the seminar. The nursing home was expecting a critical shortage of nursing assistants, as there were 19 nursing homes in a 25-mile radius. The existing nursing assistants were getting extremely tired and burnt out. Since many nursing aides were leaving and could not be replaced, there was a shortage of staffing, resulting in everyone having many problems. Further, the patient population had changed over the last three years from intermediate care to more skilled care. The administrator and the director of nursing helped with patient care for 3 months due to the shortage of nursing aides. Early in 1992, the administrator and director of nursing went out on the unit and worked with the nursing aides to see how much lifting they actually did. They found that the nursing aides were doing between 30-60 manual

lifts per day. The management asked themselves "what can we do to make their job not so strenuous?" Management realized that the injuries were occurring because the nursing aides were tired. They started to see some mysterious injuries in the second shift which, according to the management, were probably reported because employees wanted to take a few days off. Early in 1992, the nursing home decided to pilot a "No Manual Lifting Program" when approached by the insurance company. Before deciding to proceed, however, the program was discussed in detail with the nursing aides. The administrator stated, "I felt that if they weren't going to support it, then implementing the program would be difficult. We also made it clear that if we went into the program, we'd stick with it." Meetings were also held with patients (residents) and their families to get their acceptance. The nursing aides, the patients and their families were very receptive and supportive of the program. With a lot of conversation they understood the need and were willing to go along. They realized that patients did not have the right to put employees at risk (residents' rights versus employees' safety). The nursing home lost 3-4 nursing aides when the program was initially implemented because the use of the patient transferring equipment was not an option and they did not want to use it. Initially, nurses were made in charge of the program. The management soon realized that the nurses either did not have enough expertise or did not want to manage the transferring equipment for a patient. Therefore, a core group of nursing aides called "key operators" was made in charge of the program. The administrator and the director of nursing met with the key operators once a week for the first 8 weeks, then once a month for the first year., and then once every 2-3 months in following years. The key operators assessed all new admissions and were responsible for training new employees. For the first five days all new employees

worked with one of the key operators. At least two key operators had to approved a change in transferring needs of the patient. If nurses or nursing assistants had questions, or had problems with a patient transfer they had to go to one of the key operators. A list of key operators was posted in each hallway and bathroom. Patients, patient roommates and co-workers monitored compliance with the use of patient transferring devices and would inform the management or the key operators if the devices were not being used.

The nursing home surveyed nursing aides about the program one-year after implementation. All but two of the facility's nursing aides said the program was worthwhile. Perhaps the most telling indication of the program's benefit was its impact on turnover. Before implementation of the program the turnover rate was 150%. After implementation it dropped to 40%. For patients, no manual lifting resulted in fewer skin tears and bruises. According to both the management and employees use of the mechanical lifts had also been helpful in transferring combative patients. The nursing home invested $50,000 in mechanical lifts. According to the administrator, "we figured out that, conservatively, it cost $300 to find and train a new nurse aide, at that kind of cost, if your turning over 100 people a year you've pretty much paid for the equipment. You've also paid for the equipment if you prevent just one injury." Before the implementation of "No Manual Lift Program," the insurance premiums were $170,000 per year. The premiums for 1995 and 1996 were $76,000 and $55,000, respectively. The experience modifier decreased from 1.3 to 0.6. The equipment supplier helped assess the number and type of lifts needed and provided equipment at 0% interest loan., and also provided initial training in the proper use of the equipment.

Use/Impact of Resident Lifting/Transferring Assistive Devices

The lift team concept for reducing back injuries demonstrated promising results for the lift team intervention method. Limitations that impact outcomes suggest that no funding was available for the program evaluation, limiting the amount of control and program method design from one hospital to another participating in the study. This made it difficult to standardize data among the participating hospitals. However, current trends among participating healthcare facilities indicated that staffing levels decreased, patient acuity increased, and staffs skills decreased. Over 20 lifting team members participated in the study. There were no team members that reported or complained of injuries resulting from lifting and transferring of patients. It is anticipated that mandating the use of mechanical lifts for total body transfers prevents injuries. It is also believed that injuries were also prevented by utilizing lift team specialists with extensive training on the application and use of mechanical lifting equipment (Charney, 1997). The purpose of preventing injuries largely impacts the outcomes of:

- reducing back injuries and decreasing lost work days,
- reduce workers' compensation costs,
- improved nursing morale, (as seen in perception surveys completed by nursing staff)
- improved quality of care for the patient, and
- reduced absenteeism and turnover among nursing staff.

Based on a survey of 120 long-term care facilities through a questionnaire Garg et al. (1992) reported that a lift sheet, bathtub lift, hydraulic hoist, and gait belts were the devices often provided in nursing homes, only half the facilities used them on a frequent basis where they were available. They also reported that the mobile hoist was used

primarily for bathing and that too was used only in 23% of the wards. Manual lifting was used 96% to 99% of the wards for transferring residents into chairs, beds and toilets and for repositioning patients. Only 5-6% of the nursing aides used a mechanical hoist often. Garg described the reasons most often mentioned for not using assistive devices as follows:

- lack of skill;
- time involved;
- lack of availability;
- lack of space to store equipment when not being used;
- use of more than one person to operate equipment required;
- patient fear; and
- safety

According to Garg et al (1992), the amount of time required to lift and transfer patients with mechanical hoists is often given as one of the major reasons for not using them. In conclusion, only a few assistive devices (chairlift, hydraulic hoist, and gait belts) are available to nursing assistants for lifting and transferring patients. Except for chairlifts, these devices were rarely used. The assistive devices were poorly designed, they were not easily accessible and nursing assistants were concerned about patient safety when using these devices. As a result, manual lifting and carrying was the most common method used for patient transfers. The beds, wheelchairs, lavatories and bathing areas were also poorly designed. This made patient transfer more difficult and created additional postural stresses for nursing assistants.

This study found high prevalence of low-back pain among nursing assistants. On the average, a nursing assistant experienced four episodes of low-back pain in the last three years and three out of four were not reported. Fifty-one percent of the nursing assistants visited a healthcare provider for work-related low-back pain and the average number of visits per nursing assistant was five.

Techniques and Guidelines for Manual Handling Tasks

EBI (1999), a national workers' compensation carrier, collected the following information during the Injury Review Process (IRP) with nursing assistant employees that sustained work related back injuries:

IRP # 1(nursing assistant)

Employee #1 explained that she sustained a low back injury when she was trying to slide or reposition a nursing home resident that slid down in bed. Employee #1 indicated that she did not ask for assistance to complete the task. She did not use any mechanical lifting devices or draw sheets to assist in the repositioning task. She also stated that when she tried to place her hands under the resident's shoulders she could not get a straight angle because the resident's nightstand was in the way.

IRP #2(Radiology Technician)

Employee #2 explained that she received a patient from the emergency room on a stretcher in need of x-rays. The patient on the stretcher weighted 250lbs. Employee #2 stated that she needed to transport the patient from the stretcher onto the x-ray table. The employee stated that she used a plastic slide board. When she reached across the x-ray table she grabbed a-hold of the handles on the slide board and began to pull the patient from the stretcher onto the x-ray table. While completing this task she stated that she felt

a pop in her upper back rights side shoulder area. This is the method that is used in the hospital to slide patients from stretchers onto beds or procedure tables.

IRP #3(nursing assistant)

Employee #3 sustained a low back injury while attempting to walk a nursing home resident a distance of approximately 5 feet from her wheelchair to the bathroom when the resident lost her balance and began to fall. Employee #3 stated that she tried to react to the fall and in doing so she twisted her own body trying to grab a hold of the resident while she was falling. Employee #3 indicated that the resident could not walk safely alone and that she was approximately 80% weight bearing. This simply means that if the resident does not have assistance with walking there is a 20% chance that she could lose her balance and fall. Therefore, the care plan for this resident indicated that there must be the assistance of two for any transport task executed.

The following recommendations have already been suggested for implementation as a result of the IRP's being completed:

Recommended Action – Employee #1

When reviewing this incident with the supervisor and the injured employee they all agreed that by attempting to reposition any resident who has slid down in bed they must first encourage that resident to bend their own legs and push with their feet to minimize a dead weight lift. The nursing assistant should move any furniture that may cause her to not be positioned properly to eliminate any unnecessary twisting, bending and reaching. The employee should also get additional help from another employee when the resident cannot assist in the repositioning task. These methods are administrative controls only. They also discussed methods used to eliminate the lifting

exposure by engineering out the task of repositioning the resident through the utilization of a mechanical lifting device called the Hovermat. The Hovermat is a device that can be placed under a resident and filled with air through a blower unit. The Hovermat has 4000 tiny holes that air blows out of the bottom. This air reduces the friction coefficient between the bed surface and the resident making it exceptionally easy to move a resident, even one in excess of 500 lbs.

Recommended Action – Employee #2

This injury was discussed with the injured employee and her supervisor. They all agreed that any patient that must be transferred from a stretcher to a x-ray table is dangerous. Therefore, without any other recommendations they discussed purchasing a Hovermat with the x-ray department manager. After using the Hovermat on a 30-day trial from the medical equipment supplier the hospital purchased the Hovermat.

Recommended Action – Employee #3

Any transfer task that requires assisting a nursing home resident to walk when they are not 100% weight bearing increases the level of risk. I have had the opportunity to investigate this injury cause on several occasions. My first recommendation, which is a quick fix, but has proven to be effective is to require that all transfers that involve assisting nursing home residents to walk, be executed with the use of a gait belt. By using a gait belt the nursing assistant can get a much better hold onto of the resident and assist to improve their stability. If the resident should begin to fall there is not going to be an impact and twisting of the nursing assistant to grab onto a limb of the resident. The nursing assistant while holding firmly onto the gait belt can lower the resident to the floor preventing serious injury to self and the resident. The second recommendation will

engineer out this exposure by use of the Sit-to-stand lift. The Sit-to-stand lift could be used in those situations when the resident is only 50% weight baring or when a resident has been medicated or is just having a bad day getting around. The Sit-to-stand lift is different from the Full lift in that the full lift should be used when there is no chance of the resident using their own physical strength for rehabilitative purposes.

Zhuang et al. (1995) explains that extensive research has been performed in an attempt to develop guidelines for manual handling tasks in the last decade. Individuals, companies, and governmental agencies have spent large amounts of time and money developing these guidelines to decrease the incidences of low back pain and injury. The four approaches that the researcher identified which were most commonly used in research are:

- epidemiology,
- biomechanics,
- physiology, and
- psychophysics.

According to Zhuang et al., the National Institute of Occupational Safety and Health (NIOSH) and Snook developed the two guidelines used most frequently. Snook's guidelines used the psychophysical approach and address variables such as object weight, horizontal location, vertical location, travel distance, and frequency of the lift. They have developed tables for maximum acceptable loads for men and women, maximum acceptable forces of pull for men and women, and maximum acceptable weight of carry. NIOSH's guidelines include the same variables as Snook's psychophysical guidelines and add the duration or time period of lift variable (Snook et al., 1991). NIOSH has

developed formulas that provide action limits and maximal acceptable limits for different types of lifting activities (Zhuang et al., 1995). NIOSH's work practices guide and Snook's psychophysical lifting guidelines have helped reduce the incidence of injuries to the back. Unfortunately, the tasks performed in a nursing home are varied, are not standardized, and are poorly modeled by the guidelines. Therefore, more research is needed to establish resident-handling guidelines which will protect nursing personnel from excessive injury risk (Zhuang et al., 1995).

Zhuang et al. (1995) found the most stressful tasks performed by nursing assistants in nursing homes with regard to back injuries were identified and ranked by using four methods. Two methods were based on employee perceptions and two were based on biomechanical measures. The employee perception method requested that nursing assistant participants rank the resident-handling tasks that they felt were most stressful in their duties. The resident handling tasks were ranked in the following order:

1) transferring a resident from toilet to chair,
2) transferring a resident from chair to toilet,
3) transferring a resident from chair to bed,
4) transferring a resident from bed to chair,
5) transferring a resident from bathtub to chair,
6) transferring a resident from chairlift to chair,
7) weighing a resident,
8) lifting a resident up in bed,
9) repositioning a resident in bed,
10) repositioning a resident in chair,

11) changing the briefs worn by a resident,

12) making the bed with a resident in it,

13) undressing a resident,

14) tying support,

15) feeding a bed-ridden resident, and

16) making the bed when a resident is not in it.

According to Zhaung et al. (1995), the order of the patient-handling tasks based on the biomechanical measures is different from the above ranked order. The top four tasks based on the rating at the lower back are:

1) transferring a resident from toilet to chair,

2) transferring a resident from chair to bed,

3) transferring a resident from chair to toilet, or

4) transferring a resident from bed to chair.

Biomechanical Stresses

Andres (1997) reported that better science is needed to support upgrading facilities or purchasing mechanical assistive devices so that cost effective and ergonomically sound decisions can be reached. Some advocates are pushing for a zero-lift policy where residents cannot bear a significant amount of their own body weight. These proponents, according to Andres (1997), claim that the reduction in biomechanical stresses as a result of utilizing mechanical assistive devices is great, and hence justify the high cost of outfitting a facility with an adequate number and variety of mechanical assistive devices. Andres (1997) reported that there are two problems with this approach – up until recently there has been no compelling evidence that the biomechanical stress

reduction is great, and secondly the impersonalization of the process of transferring residents can actually impede any rehabilitation processes that might improve a residents personal mobility. Andres (1997) indicated that researchers at West Virginia University, working with researchers at NIOSH, have completed a study of the biomechanics of transferring residents with assistive devices or manually. A summary of their findings follows:

Eleven assistive devices and one manual technique for transferring nursing home residents from bed to chair were evaluated biomechanically. Subjects were nine nursing assistants and two elderly persons, and all testing took place in a biomechanics laboratory. Measurements of body postures were acquired with three-dimensional video, while force measurements came from two force platforms on which the nursing aids stood. These measures allowed the derivation of estimates of the magnitude and direction of the hand forces exerted by the nursing assistants as they performed the transfer task. These hand force estimates were fed into a computer model (University of Michigan 3 Dimensional Static Strength Prediction Program) along with the height, weight, and posture of the person performing the transfer to yield stresses on the low back and strength demands on the major body joints. The assitive devices tested included a walking belt, a sliding board, four brands of stand-up lifts, an overhead lift and four brands of basket-sling lifts; these were all compared to a manual transfer without assist. Four major activities were investigated:

1) lifting/rolling/rotating the resident to prepare for a transfer,
2) helping/pulling the resident to a stand position,
3) pushing/turning lift devices or gliding the resident across a sliding board, and

4) pulling a sling handle to position the resident in an upright position in a chair.

The study found that basket-slings and overhead lifts significantly reduced the biomechanical loads on the nursing assistants back for the first activity. However, during preparation for the stand-up lift and sliding board transfers the biomechanical stresses were not significantly different from the manual transfer. In general the use of resident handling devices reduced the biomechanical stresses on the low back during the lifting phase of the transfer. Some of these decreases were on the order of 20% or more, which is a significant reduction. Significant differences were found, however, in the forces required to pull the sling handle on the basket-sling lifts- indicating that there is still room for improvements of the assistive devices.

Education and the Lift Program Management Process

Gray et al. (1996) reported that in recognition of the high risk injuries occurring among nursing personnel working in geriatric settings the Saint-Vincent Hospital in Ottawa, Canada, a 516-bed long-term care and rehabilitation hospital, developed a lift and transfer education in 1984 and updated the program in 1989. The 1989 update of the educational program was designed to provide "continuing" education regarding lifts and transfers to augment and provide a "booster" to the ongoing program. This report describes this program and its effectiveness as established in a controlled trail. The original program designed in 1984 consisted of a leader's manual, slides, and videotape. The leader's manual contains three modules:

1) fundamentals of back-care,

2) techniques for transferring patients, for staff involved directly in patient care, and

3) care group training for staff selected to assist coworkers in practicing good back care techniques.

The slides provide basic principles of back care, and the videotape provides demonstrations of the various techniques associated with back care. Through the educational program staff are encouraged to assist their patients to move in as normal a way as possible. This results in greater independence for the patient and a decrease in work strain for the staff. Much of the material taught in the original program was based on clinical experience and the adaptation of transfer techniques to fit the type of patient at the facility. The original program was taught to 14 nursing units for 12 weeks: 8 weeks of theory and practice, and 4 weeks of clinical application. The original program was in effect until 1989. A new program was started in 1989 for all new nursing employees. This program consisted of 4.5 hours of lifts and transfer education as applied to direct patient care. A review was conducted in 1993, and an updated version of the program based on the review is the subject of this investigation. Gray et al. (1996) reported that an interdisciplinary committee, comprising occupational therapists, physiotherapists and nurses, used its knowledge of good body mechanics, as well as recommended procedures for lifts and transfers, to design a program that would be aimed specifically at nursing personnel. Primarily the resource team, consisting of the occupational health physiotherapist and a nursing education coordinator conducted the updated educational program. Two staff members and the nurse manager of he training unit were given additional training and expected to act as on-unit resource people for their co-workers. The major components of the program, which required approximately 4 hours on-site per week for 5 weeks, were as follows:

- Each shift began with the staff stretching to a warm-up video (made in-house, 5 minutes in length). Initially, the occupational health physiotherapist conducted the sessions, demonstrating the correct method of performing the stretches.
- A "transfer of the week" was selected each week and a video (made in-house) depicted the designated transfer was to be viewed by all staff at their convenience (but during that week).
- Problem solving for individual patients and staff members was done at any time, and staff members were encouraged to make use of the resource team.
- The resource team demonstrated new techniques and equipment –specifically the use of the sliding carpet and transfer disk – and staff members encouraged participation during the practice sessions.
- A loose-leaf binder was left on the unit to facilitate communication. Staff was encouraged to write any questions, feedback, or comments they had in the book, and these concerns were addressed either verbally or in writing by the resource team.
- "The Lifts and Transfer Program Manual" summarizing the policies and procedures regarding patient transfers in the facility, was also available on the unit and staff were encouraged to read any appropriate material.

For the purpose of the present study, two comparable nursing units in the long-term care facility were selected. One unit was chosen at random, to receive the program described for 5 weeks. The second comparison unit was assessed before and after but did not receive the educational program. The patients in each unit were of comparable diagnostic and demographic types, and a survey of the types and frequencies of lifts used before the

educational program yielded similar patterns. Two major outcome measures were employed:

1) knowledge of lifts and transfer procedures as outlined in the education program, and
2) satisfaction with training.

A "Lifts and Transfer" quiz to assess nursing personnel knowledge of appropriate procedures in a variety of situations was developed in three versions. Each nurse subject in each group received, at random, one of the three versions of the quiz for pre-education assessment. For post-education assessment each respondent received a different version of the questionnaire – again, on a random basis.

The second outcome variable, staff satisfaction with the program, was assessed by means of Likert scale ranging from "5" ("very useful") to "1" ("no use"), administered to nursing staff who participated in the program.

Initially there was no difference between the two units studied according to the results of the pre-educational assessment quiz. However, the post-educational version of the questionnaire showed a significantly higher percentage of correct answers for the nursing staff that received the "Lift and Transfer Educational Program" than that of the nursing staff that did not receive the "Lifts and Transfer Educational Program." Staff satisfaction with the program was indicated by 88 out of a possible 120 (73%) responses on the questionnaire being in the "very useful" or "useful" categories.

To determine whether the increased knowledge demonstrated by the trained group was translated into appropriate lifting behavior, 6-week and 6-month follow-up observations were made on a random basis. These observations involved 1-day and 1-evening shift of staff who had received training during the program. Gray et al. (1996)

reports that the results were encouraging; during the time of observation all observed lifts and transfers were performed within acceptable parameter.

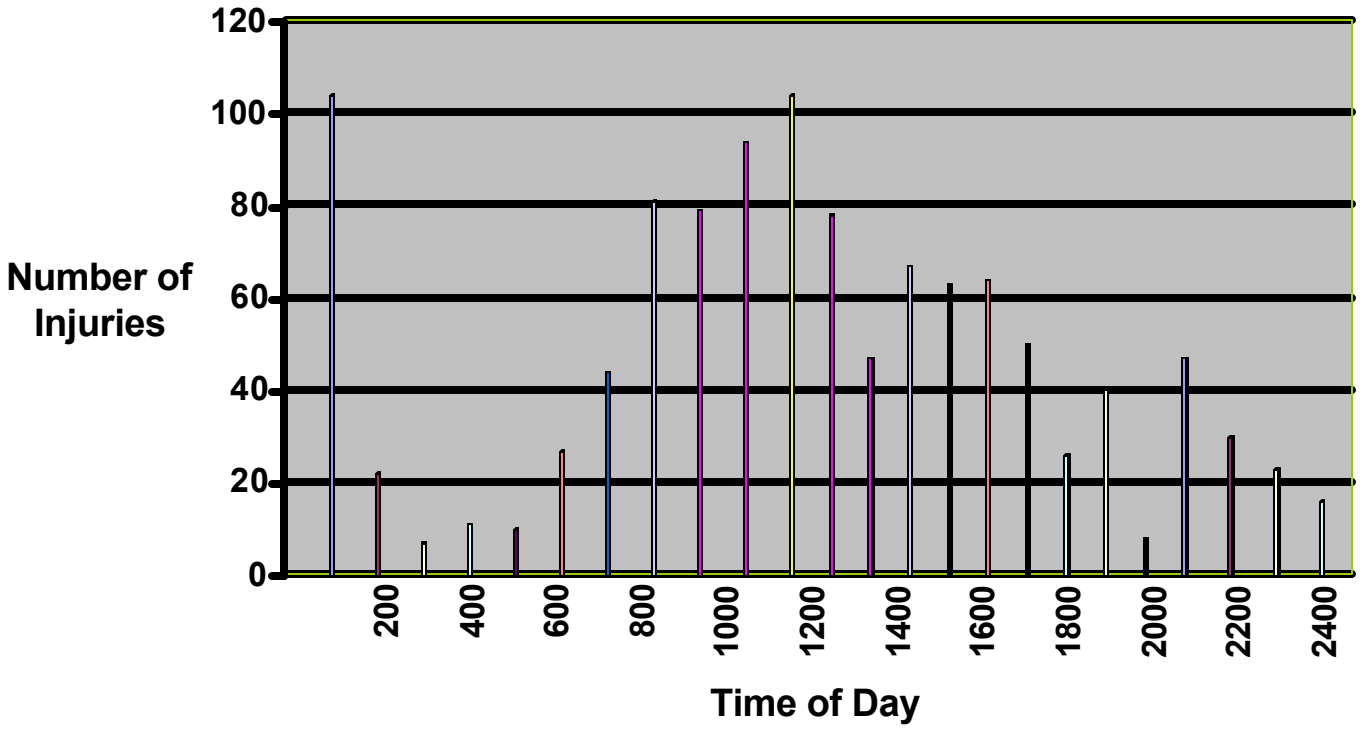
As a direct result of this project the following changes have been implemented:

1) the use of pictograms as a visual reminder of the appropriate transfer techniques,
2) increased use of a sliding carpet in repositioning patients in bed, and
3) increased use of transfer belts.

Each nursing unit now has a representative who attends a monthly 1-hour lift and transfer session. The agenda is prepared in consultation with unit representatives. This method of providing education can be passed on to all units and still tailored to their special needs. This lift program management process places the responsibility and accountability for education on the nursing staff but also provides them with a resource team for help and encouragement.

Time of Injury

A review of an Association Analysis from Pennsylvania Health Care Association (1999) provides data from 85 participating long term care facilities in Pennsylvania. The "Time of Injury" summary has the number of injuries and time of injury broken down by hour in military time. The graph identified as Figure 2 illustrates the "time of injury" on the x-axis and the "number of injuries" on the y-axis. Figure 2 indicates that most of the injuries occurred between 8:00 AM and 12:59 PM. The lesser number of injuries occurred between 2:00 AM and 07:59 AM. One can only assume that the majority of the injuries are occurring during the time of day when staffing levels are highest along with more direct patient care activities being administered.



Source: Pennsylvania Healthcare Association, 1999

Figure 2.- Time of day per total incidents

The major activities that one must complete from 8:00 AM through 1:00 PM include:

- getting residents out of bed;
- helping residents to get dressed;
- helping residents to and from the bathroom;
- changing bedding;
- bathing the residents; and
- moving residents to the meal area.

From the hours of 2:00 AM through 8:00 AM most residents are sound asleep and the interaction between nursing assistant and resident is very limited. When measuring the central tendencies of within the "time of injury" summary the following three measures have been calculated:

1) mean,
2) median, and
3) mode.

Mean is calculated:

$$\mu = \frac{\Sigma X}{N}$$

$$49 = \frac{1182}{24}$$

mean = 49.

Median is the 50 percentile or precise mid-point of the distribution. Therefore, Figure 2 illustrates the mid-point of the distribution of incidents to be at 1:00 PM and 9:00 PM with both time frames having 47 incidents respectively. Median = 47.

Mode is determined by reviewing the frequency distribution for the number of incidents' on Figure 2. The mode is the greatest frequency or the tallest part of the figure. The tallest part of Figure 2 is at 11:00 AM with a total of 104 incidents. Therefore, 104 incidents' is considered the mode, or the major mode. A minor mode can be seen at 9:00 PM. This is the time that most long-term care facilities begin putting residents to bed.

Summary of Literature Review

The critical elements that precipitate nursing personnel injuries to nursing assistants are extensive. The following elements appear to be most critical to an evaluation to nursing assistants: length of service; time of day injury occurred; task being completed when injury occurred; similar incidents in the past (accident repeaters); type of shift on which injury occurred; number of hours worked the day injury occurred; impact of company policy; availability of mechanical lifts; training on how and when to use mechanical lifts; exercise; stretching; training on safe lifting techniques or good body mechanics; gait belt use; hours per week worked at time of injury; number of residents cared for at time of injury; asking for assistance to lift, transfer, or reposition a resident; and job satisfaction.

Methodology

Research Design

The purpose of this research was to identify the root causal factors associated with lost time injuries occurring among nursing personnel working in long term care facilities. Using the list of critical elements identified from the literature review, a self-administered questionnaire was developed. This questionnaire consisted of 21 questions. The first 20 questions were multiple choice questions which required responses concerning these

critical elements. The 21st question was an open ended question which asked: "If you had your own nursing home what would you do to prevent back injuries among nursing assistants?" The purpose of this question was used to collect the specific concerns of the injured employees. The responses to this question permitted the researcher to develop risk assessment matricies (Bauer, 1994). The researcher uses a form of root cause analysis known as risk analysis in the form of a risk assessment matrix to classify risk severity and probability. According to the National Safety Council (1994), risk analysis is a root cause analysis technique in-which an accident investigator can assess whether a risk of accident exists in a procedure and then whether the risk involved is great enough to make a decision necessary regarding its elimination, reduction or acceptance.

Research was conducted by studying nursing assistants that have sustained work-related injuries while lifting, transferring, or repositioning a nursing home resident. The nursing assistants studied work at one of three northwestern Pennsylvania nursing homes. Permission was granted to review the incident data of the three nursing homes located in the following three cities: Fairview; Oil City; and Erie. These three locations employed approximately 150 nursing assistants. The researcher initially identified 96 incidents which occurred as a result of lifting, transferring or repositioning nursing home residents at these locations over a period of 5 years.

Strategies for Collecting Data

A self-administered questionnaire was used to collect data from the nursing assistants still working at the three long term care facilities. Questionnaires were hand delivered to the long term care facilities. The questionnaires were disseminated to nursing assistants who had sustained a work-related injury from lifting, transferring or

repositioning a nursing home resident. The nursing assistants completing the questionnaires did not record their names on the questionnaires. After completing the questionnaires the nursing assistants inserted their questionnaire into a self-addressed stamped envelope and sealed it shut. The nursing assistants mailed the questionnaires back to be reviewed. No persons working in the three long-term care facilities saw the individual results of the questionnaire other than the nursing assistant completing their own questionnaire. A period of approximately 60 days was allotted to collect as many questionnaires back as possible by mail. Upon the 60 days passing the questionnaires received by mail were compiled and analyzed. An example of the questionnaires disseminated to the nursing assistants is located in Appendix A.

Critical elements were determined from questions 1-20 on the questionnaire. Each critical element was assessed and analyzed through the classification of risk severity and probability. The classification of risk severity and probability for each critical element into a decision matrix is a form of root cause analysis known as risk analysis (Bauer, 1994). The risk assessment process ranked all of the critical elements evaluated into the following three corrective action categories: risk reduction required immediately; written, time-limited waiver by management required; and operation permissible-needs no reduction. Figure 3 illustrates the organization of the risk assessment matrix.

Probability

Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)					

Corrective action key:

Risk reduction required
Written, time limited waiver endorsed by management required
Operation permissible-needs no reduction

Revised with out using numbers in probability and severity

Risk Severity= The total number of nursing assistants that referred to a critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

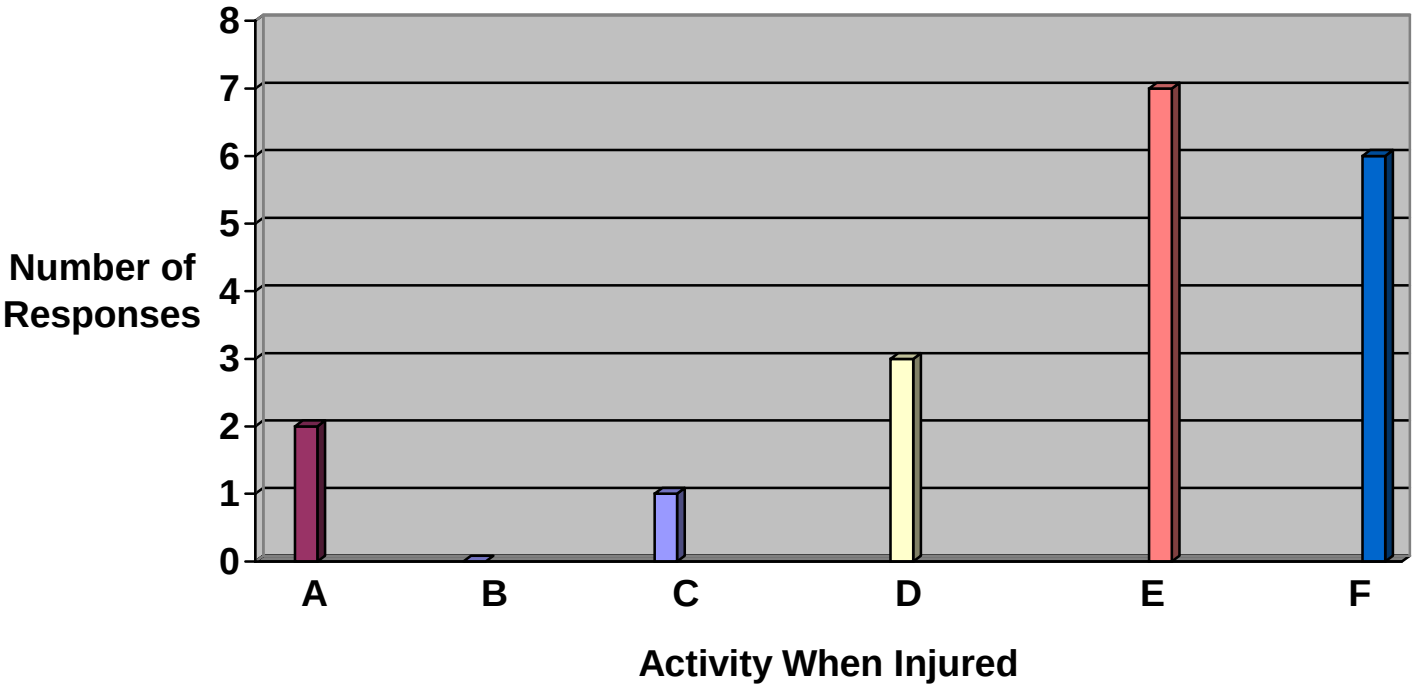
Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Figure 3.- Risk Assessment Matrix

Results

When the researcher began to distribute the questionnaires it was found that from the original 96 nursing assistants only 35 remained employees at these nursing homes. This loss of employees illustrates the high turnover that was reported earlier by the Pennsylvania Health Care Association (1999). The questionnaires were sent to all 35. Of these 35 nursing assistants nineteen completed and returned the questionnaires (a return rate of 54%). The results of these questionnaires where tallied and the results of this are shown in Figures 4 through 23.



Key

A = Repositioning resident while they are in bed

B = Repositioning resident while they are in a chair

C = Bathing resident

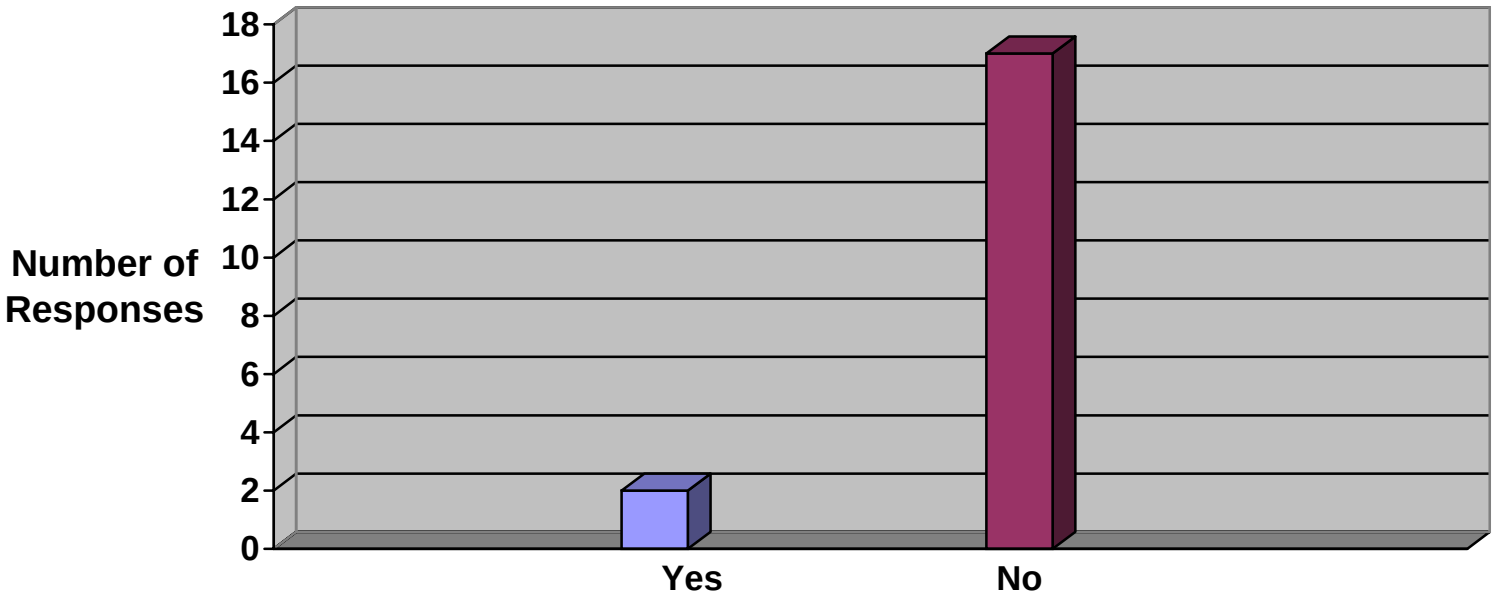
D = Assisting resident out of bed

E = Assisting resident to walk when resident began to fall

F = Other lifting, transferring or repositioning task

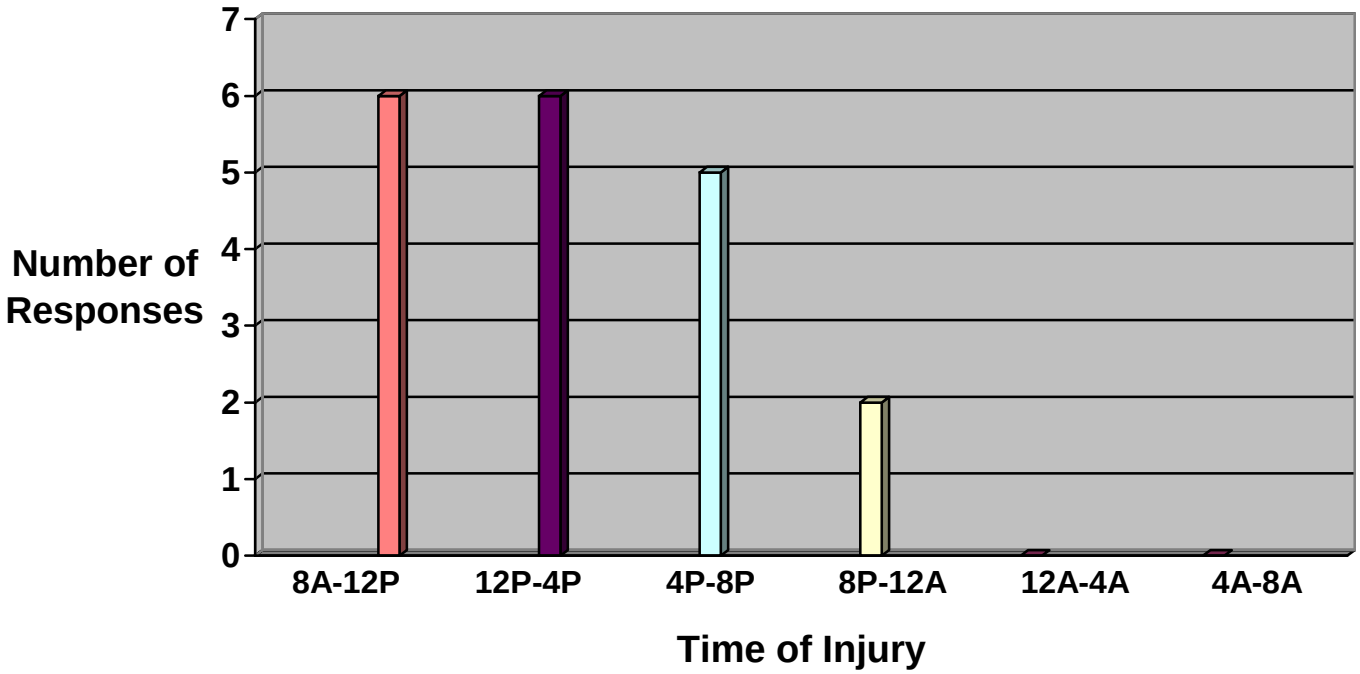
Critical Element: Task being completed when injury occurred

Figure 4.- What Task were you completing when your most recent injury occurred?



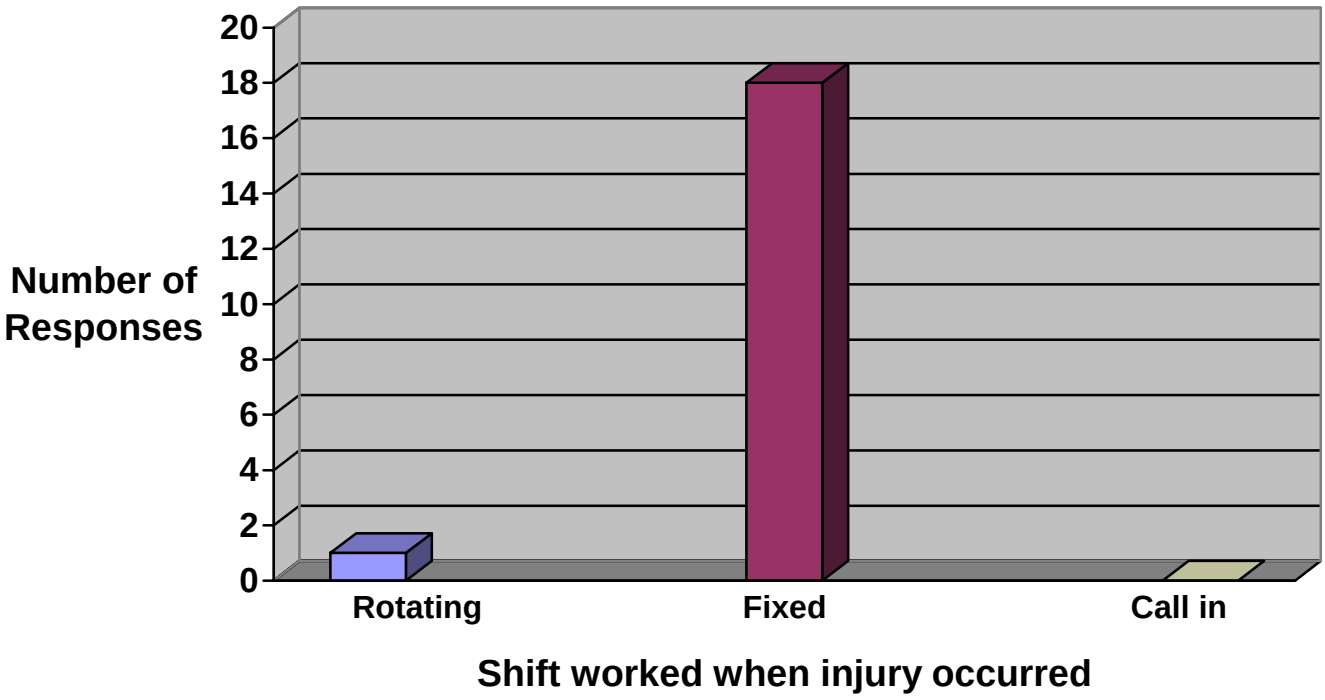
Critical Element: Similar incidents in the past (accident repeaters)

Figure 5.- Have you ever had a similar accident in the past?



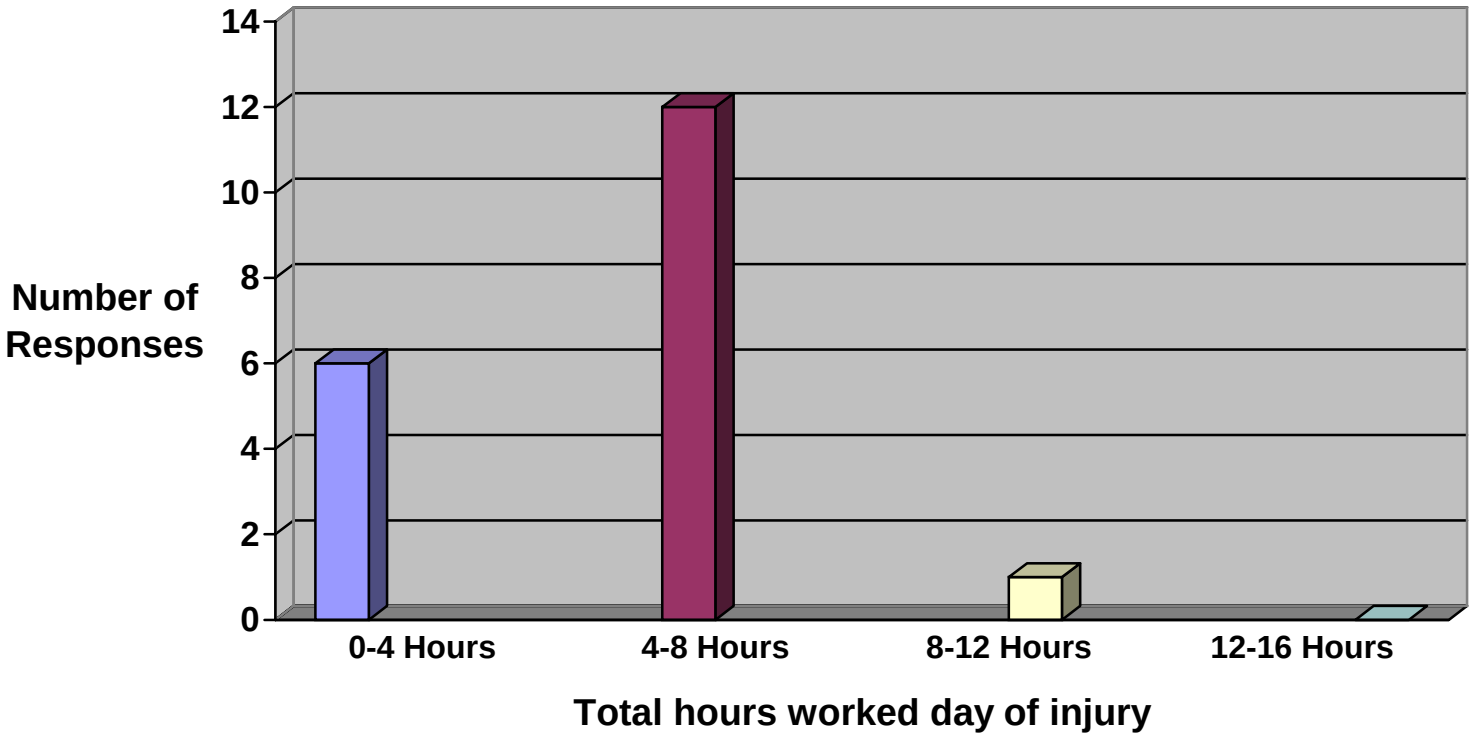
Critical Element: Time of day injury occurred

Figure 6.- What was the approximate time of day your injury occurred?



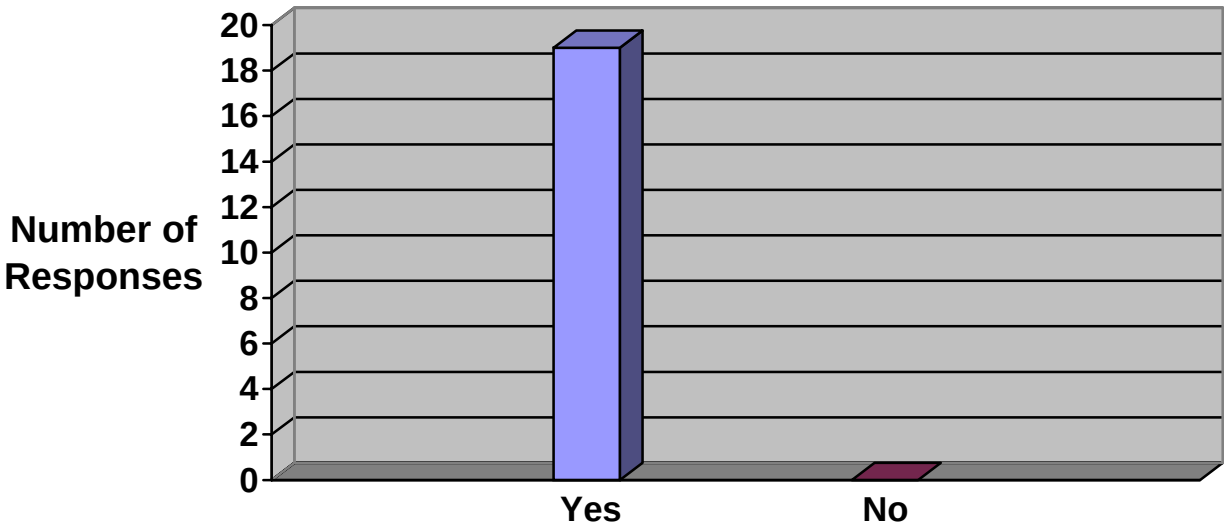
Critical Element: Type of shift on which injury occurred

Figure 7.- At the time of your most recent injury what shift did you work?



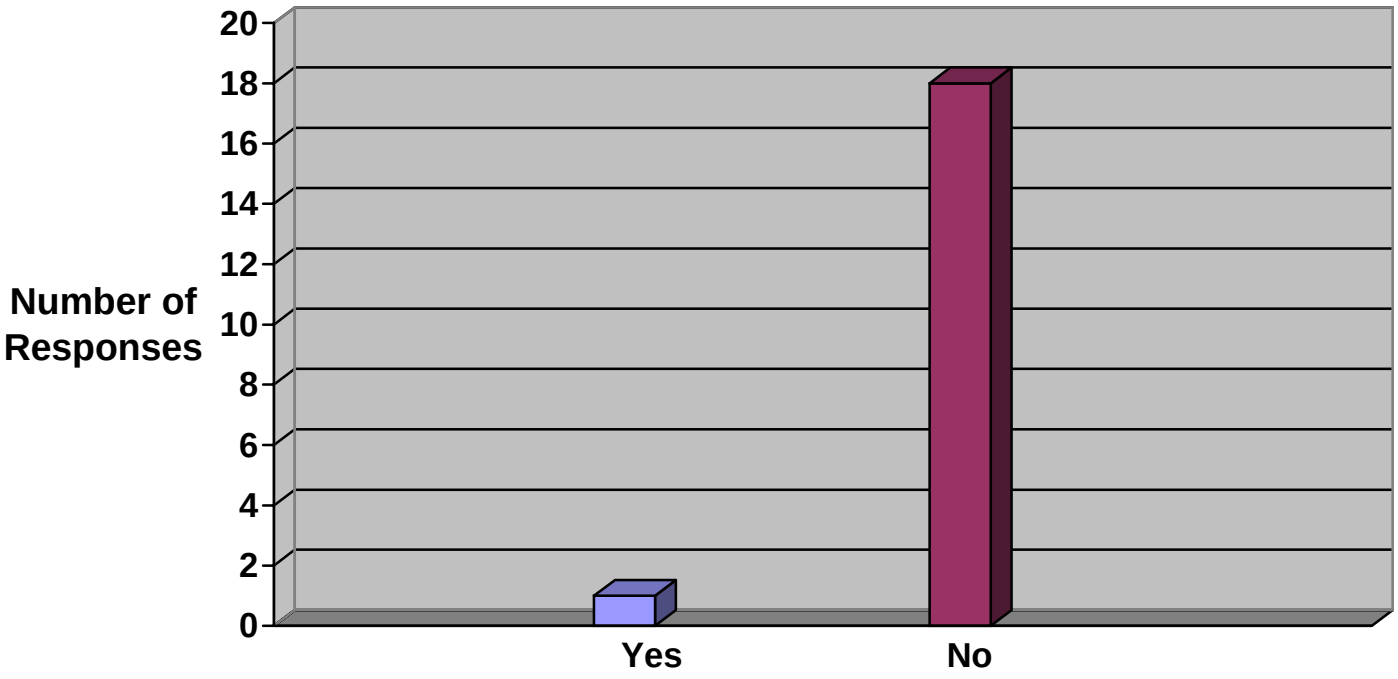
Critical Element: Number of hours worked the day injury occurred

Figure 8.- How many hours had you worked the day you were injured?



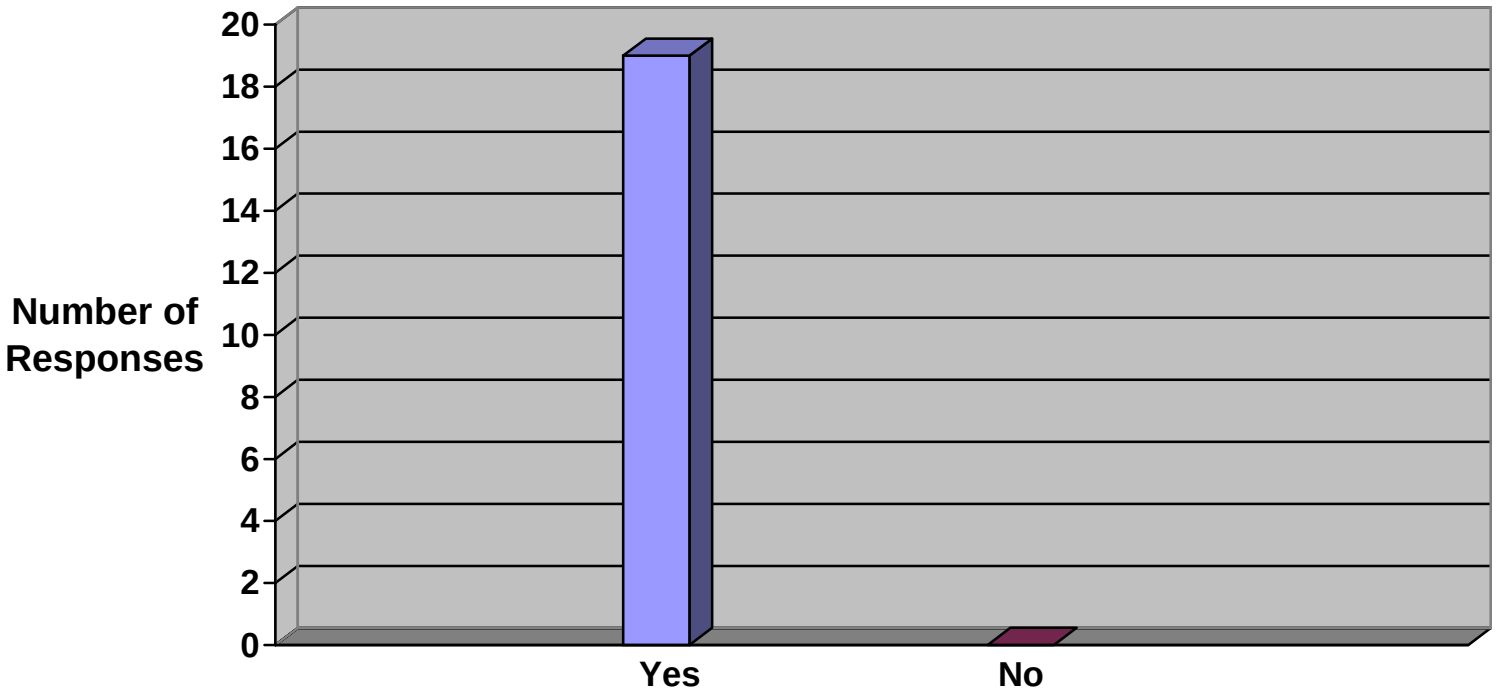
Critical Element: Impact of company policy

Figure 9.- Does your company have a policy on using resident transfer equipment?



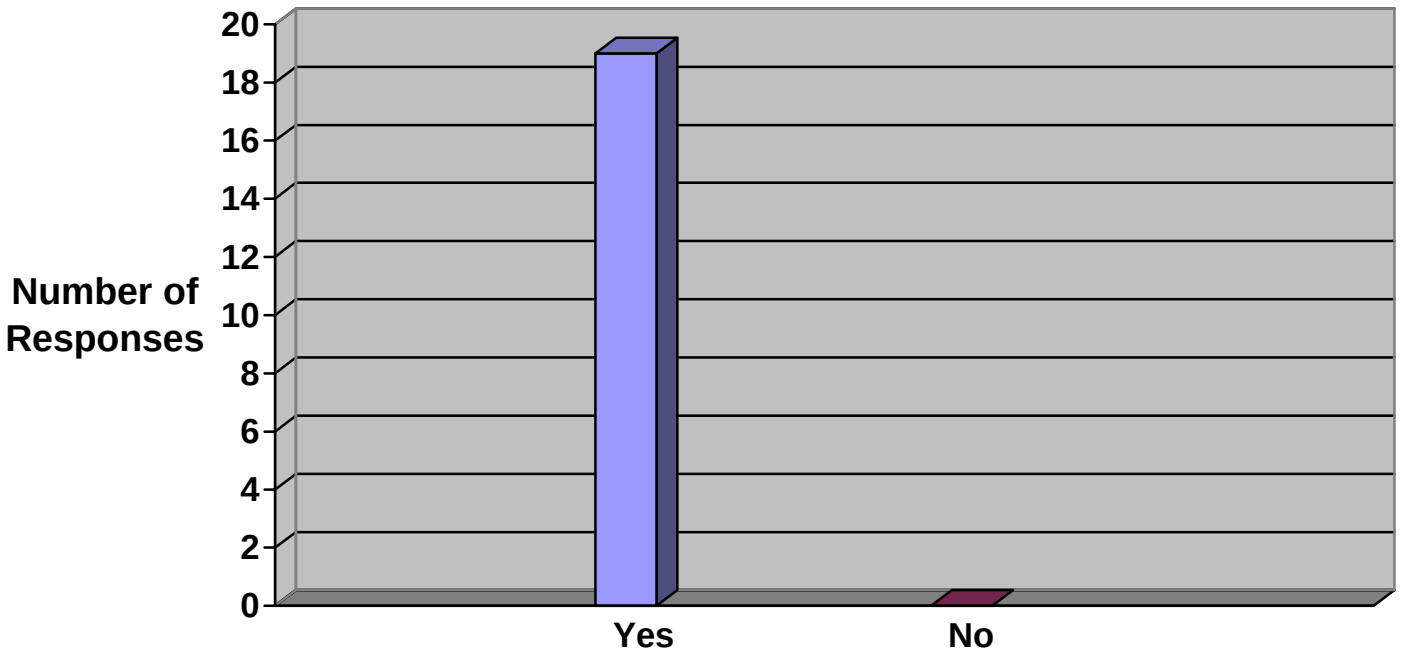
Critical Element: Training on how and when to use a mechanical lift

Figure 10.- Did you use a mechanical lift when your injury occurred?



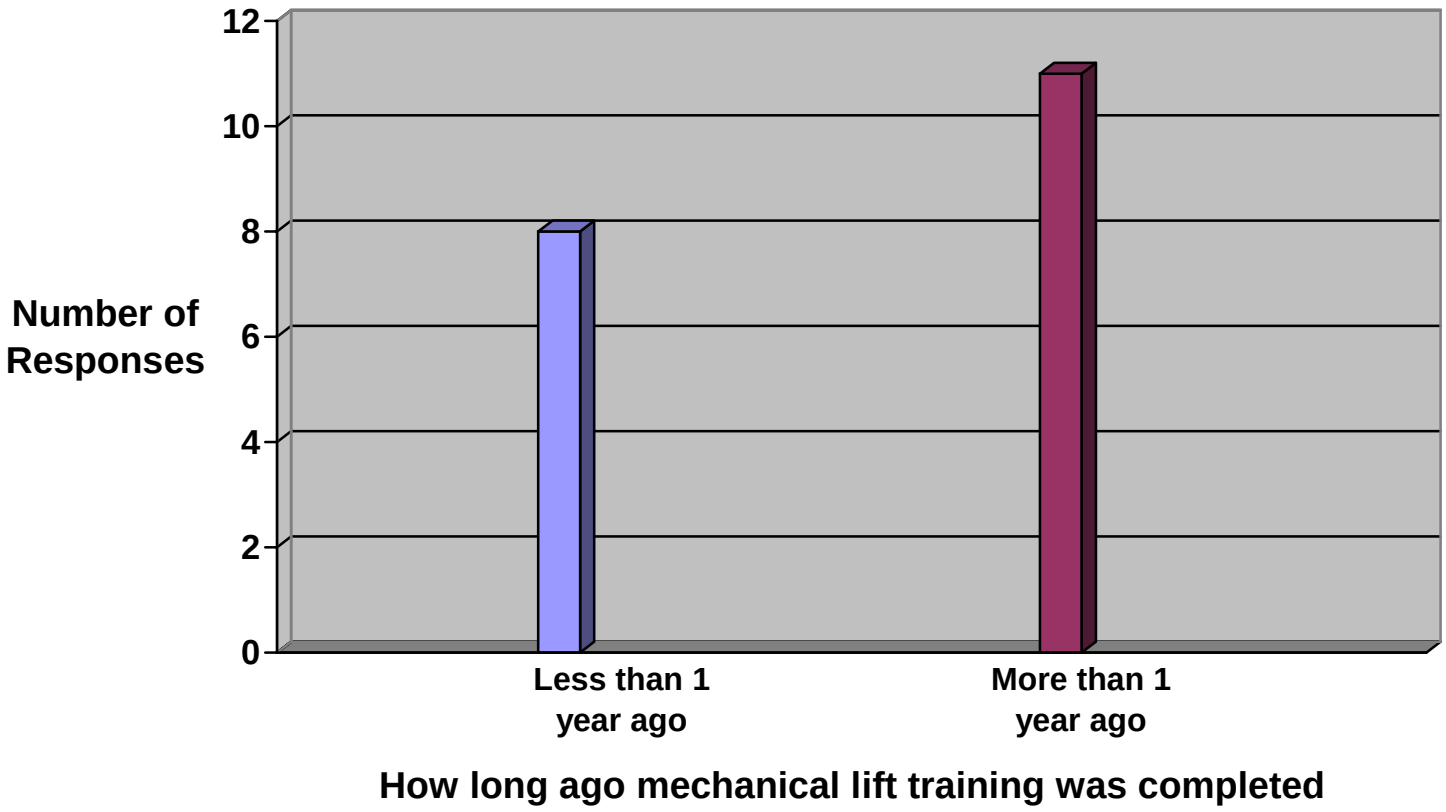
Critical Element: Availability of mechanical lifts

Figure 11.- Are mechanical lifts available and easy to find for moving residents in your facility?



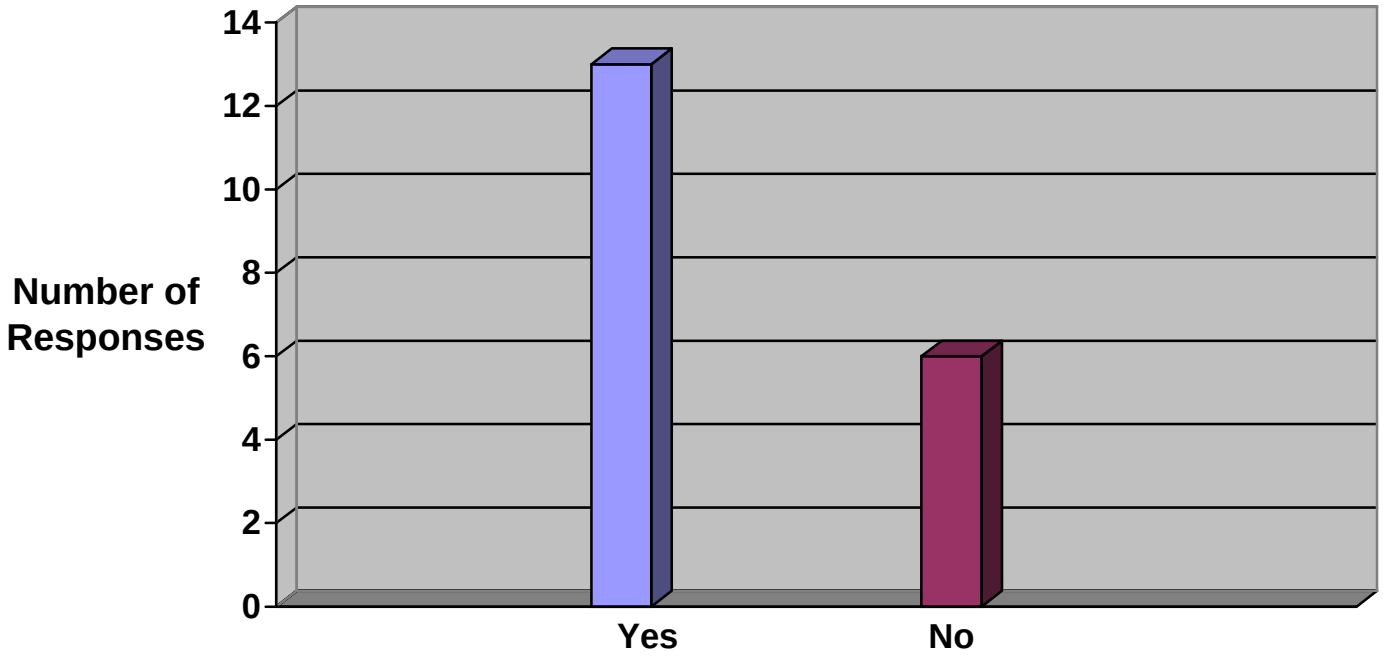
Critical Element: Training on how and when to use a mechanical lift

Figure 12.- Have you been trained on how and when to use a mechanical lift by your employer?



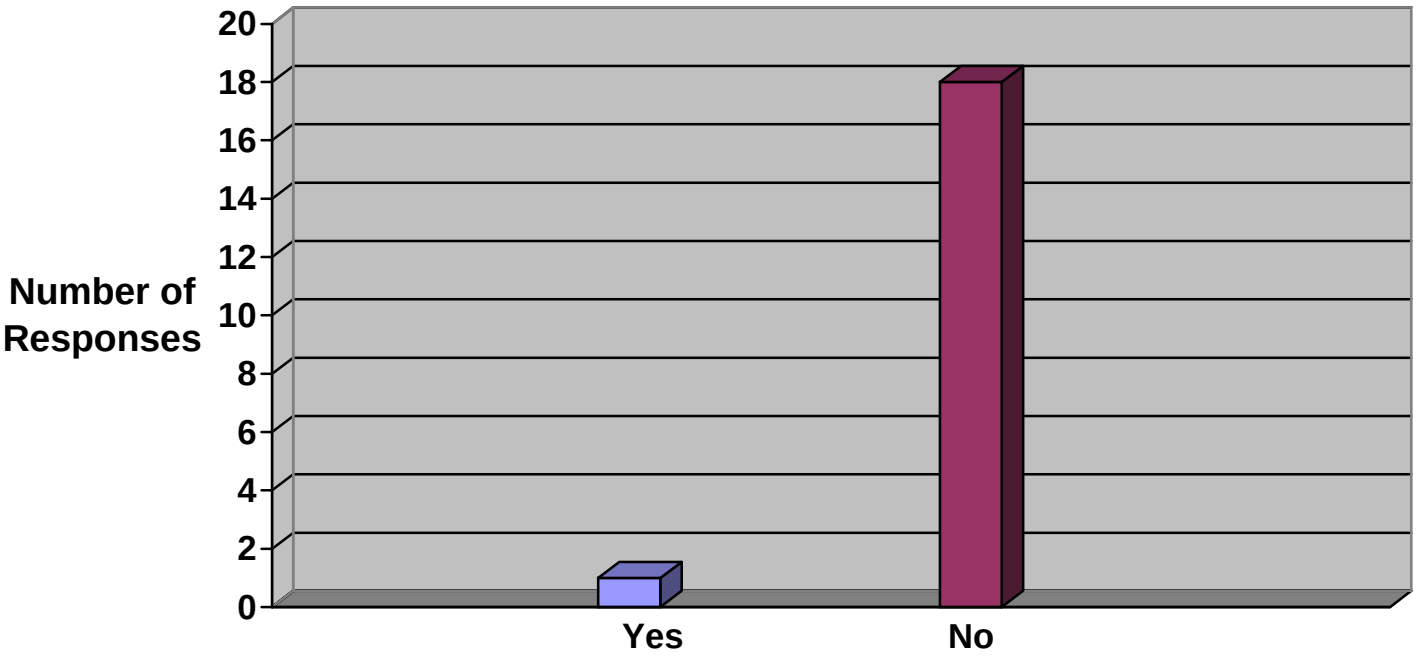
Critical Element: How long ago training was conducted on mechanical

Figure 13.- How long ago did you have training on mechanical lifts?



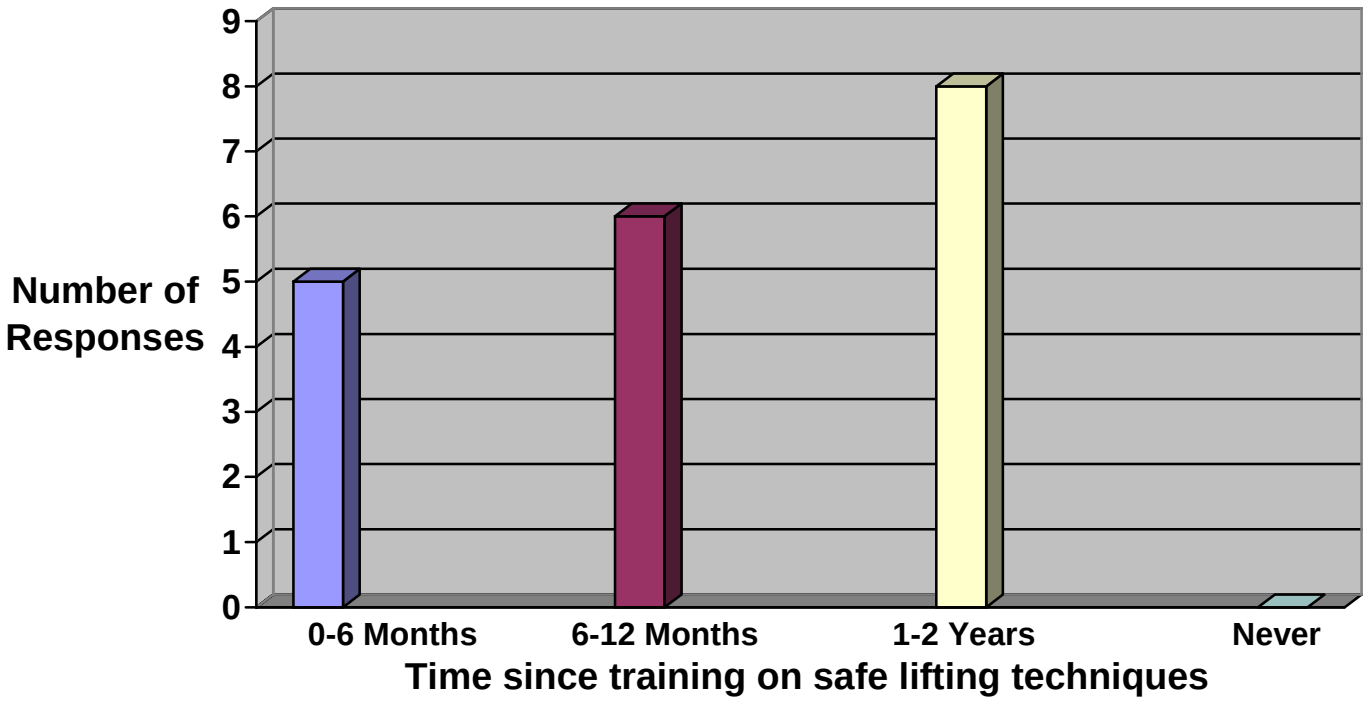
Critical Element: Exercise

Figure 14.- Do you exercise for at least 15 minutes, 3 days per week?



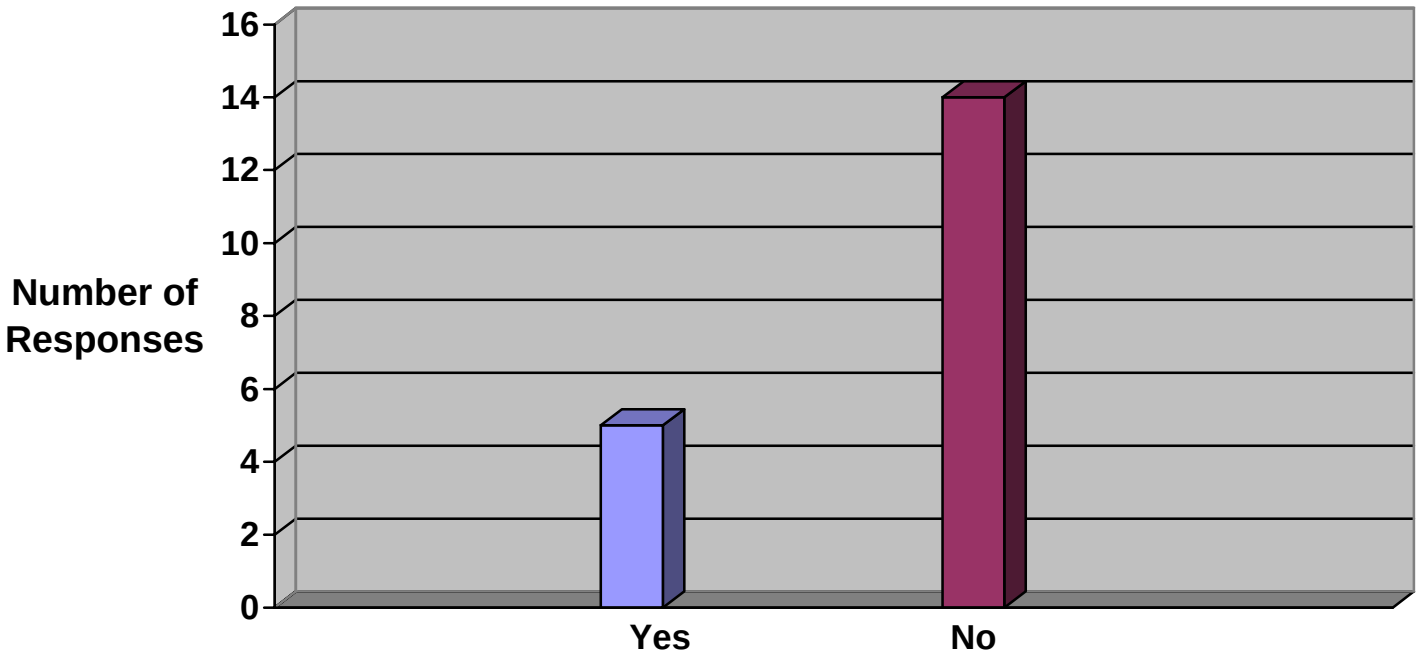
Critical Element: Stretching

Figure 15.- Do you stretch before completing a resident lifting, transferring or repositioning task?



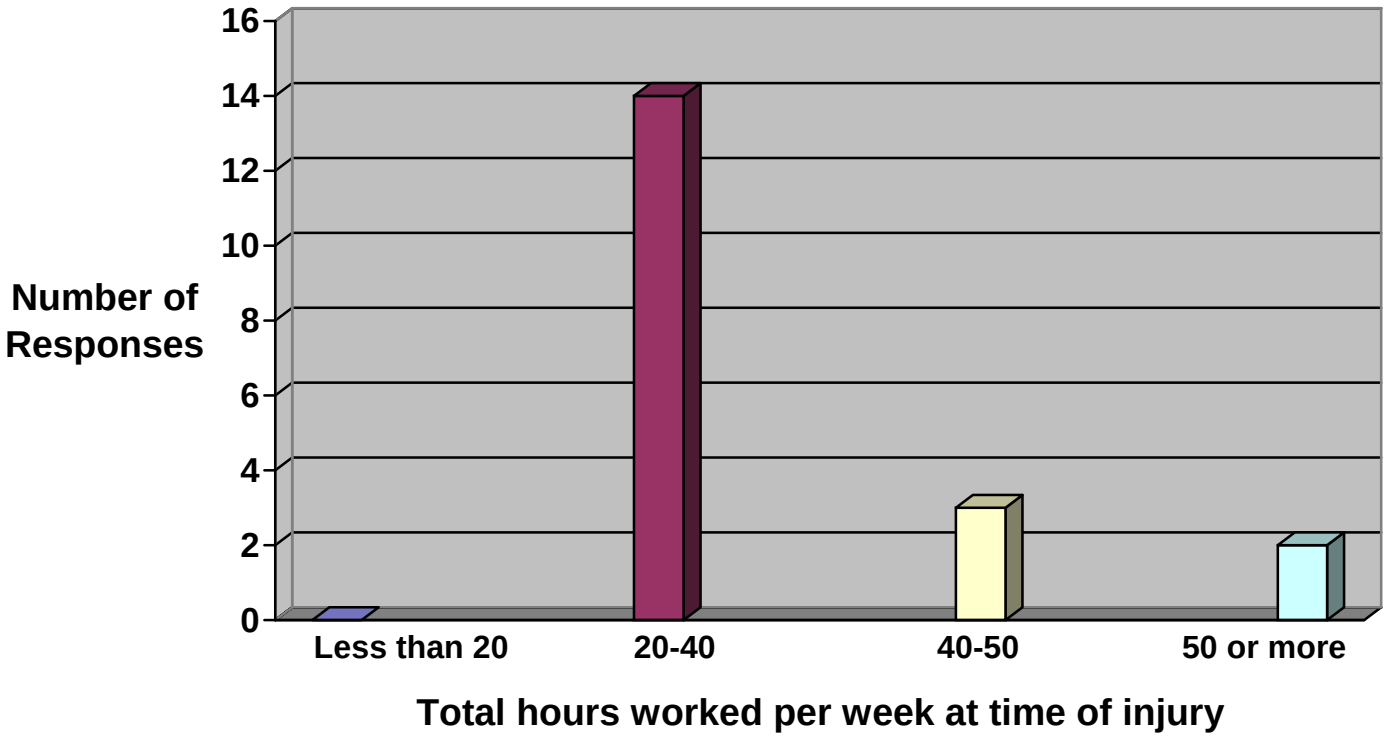
Critical Element: Training on safe lifting techniques or good body mechanics

Figure 16.- Have you been trained in safe lifting techniques or good body mechanics in the past?



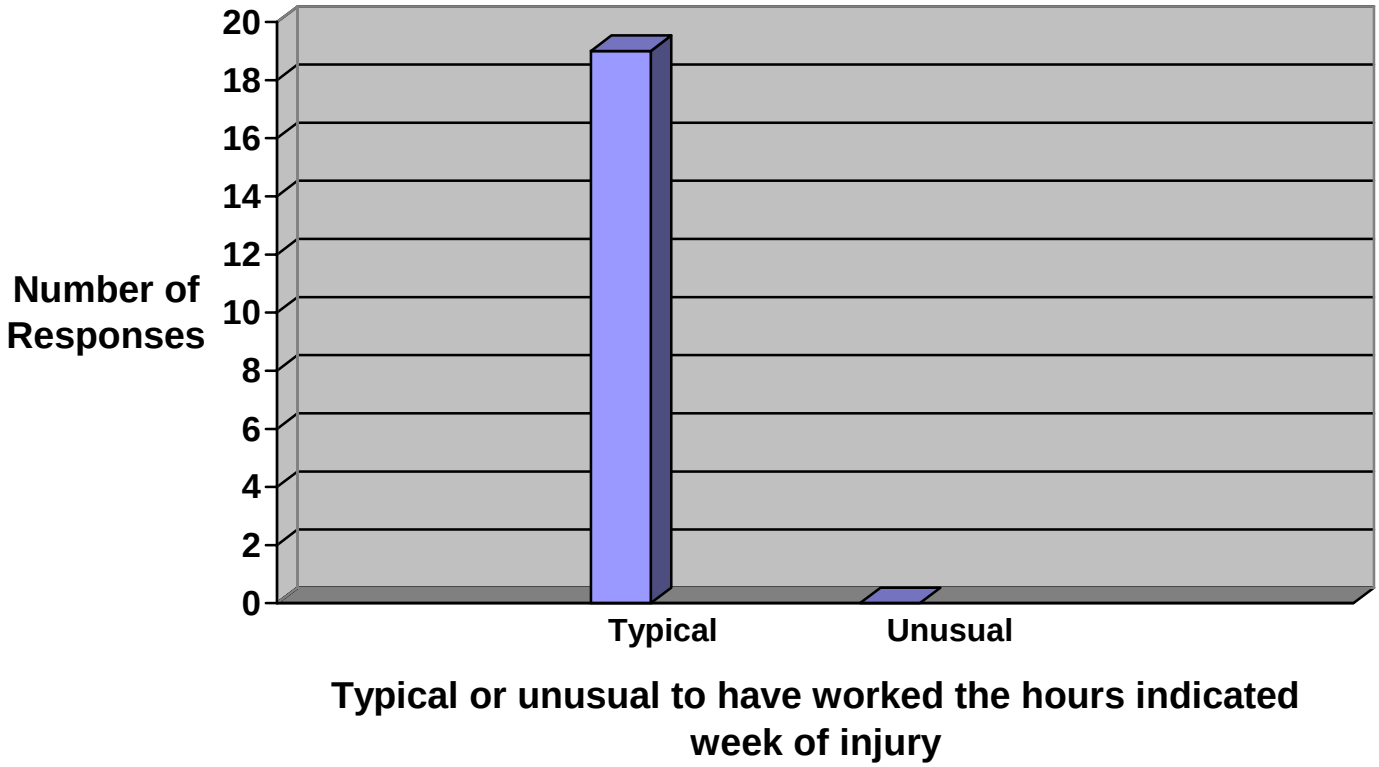
Critical Element: Gait belt use

Figure 17.- Are gait belts used regularly in your facility?



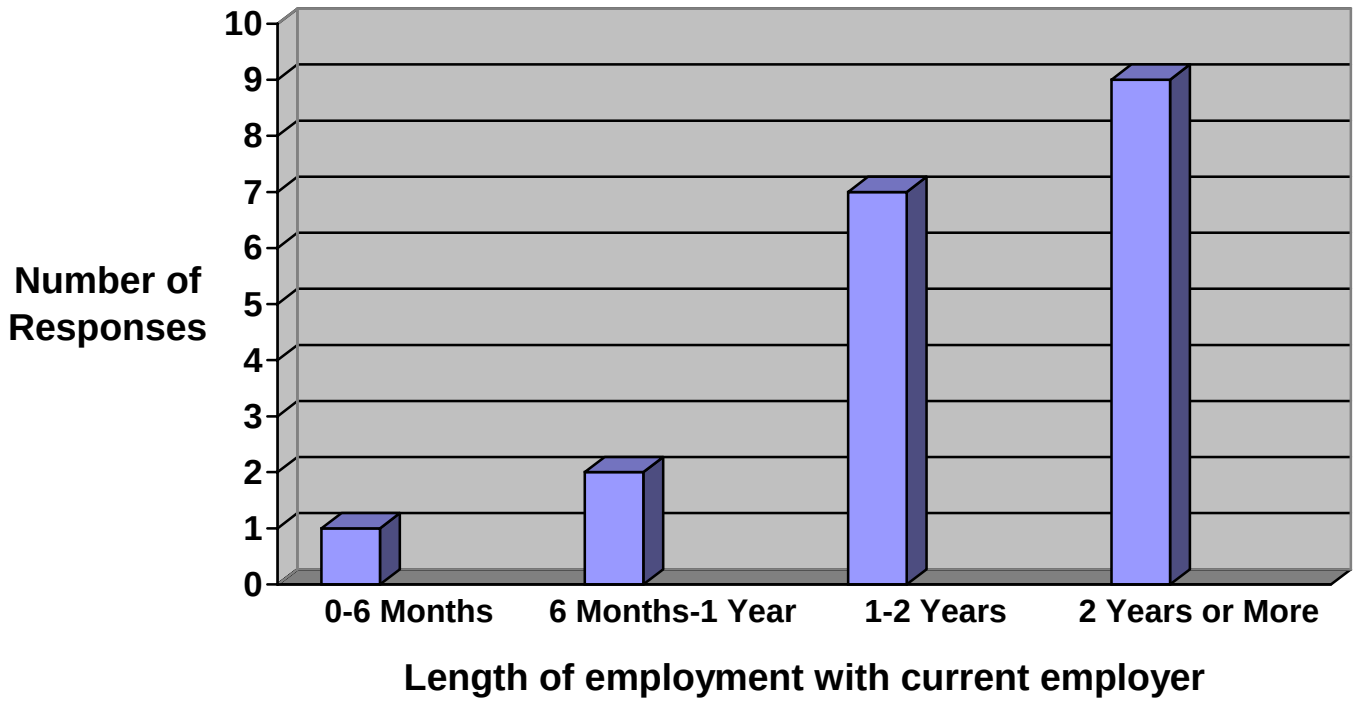
Critical Element: Hours per week worked at time of injury

Figure 18.- How many hours a week had you worked at the time your injury occurred?



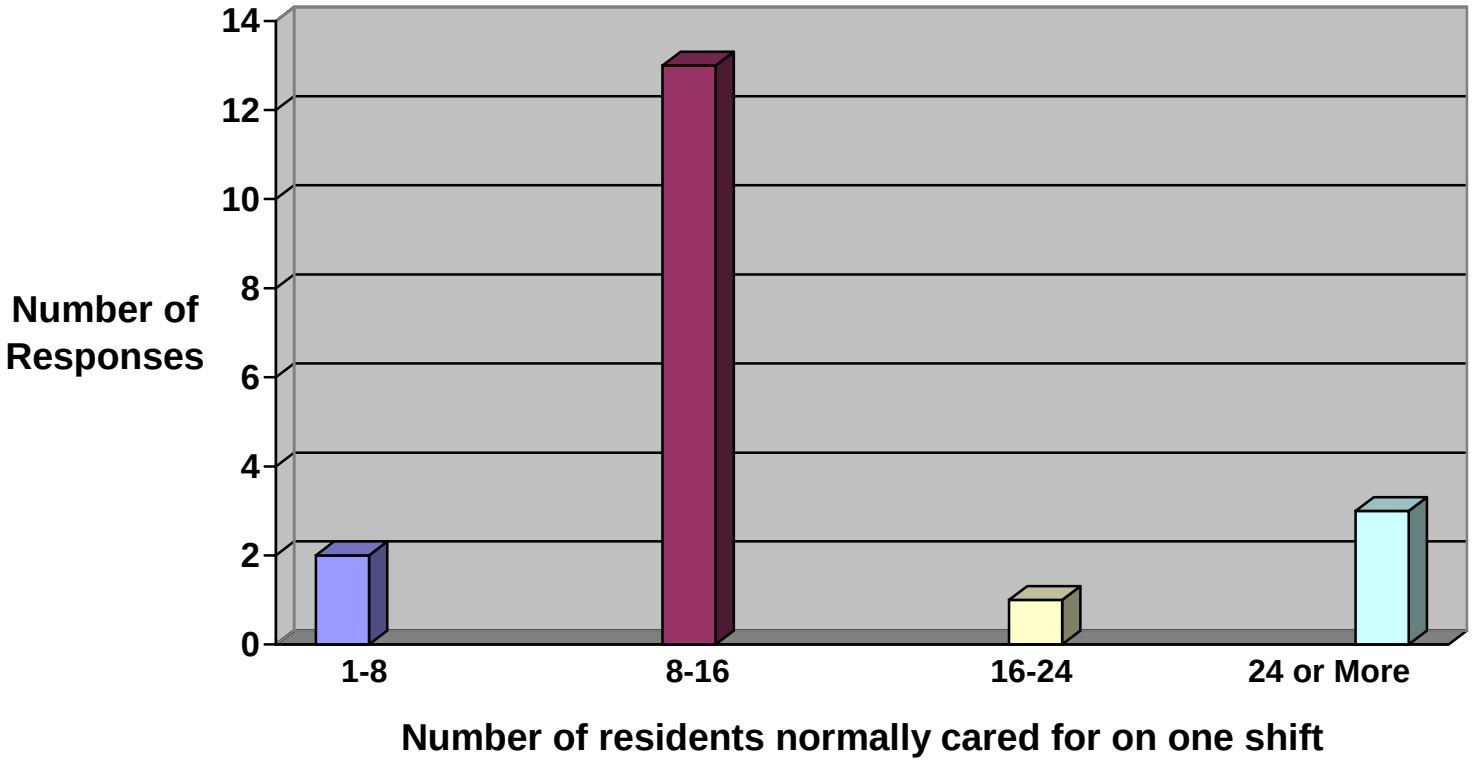
Critical Element: Hours per week worked at time of injury

Figure 19.- At the time of your injury was the number of hours worked typical or unusual?



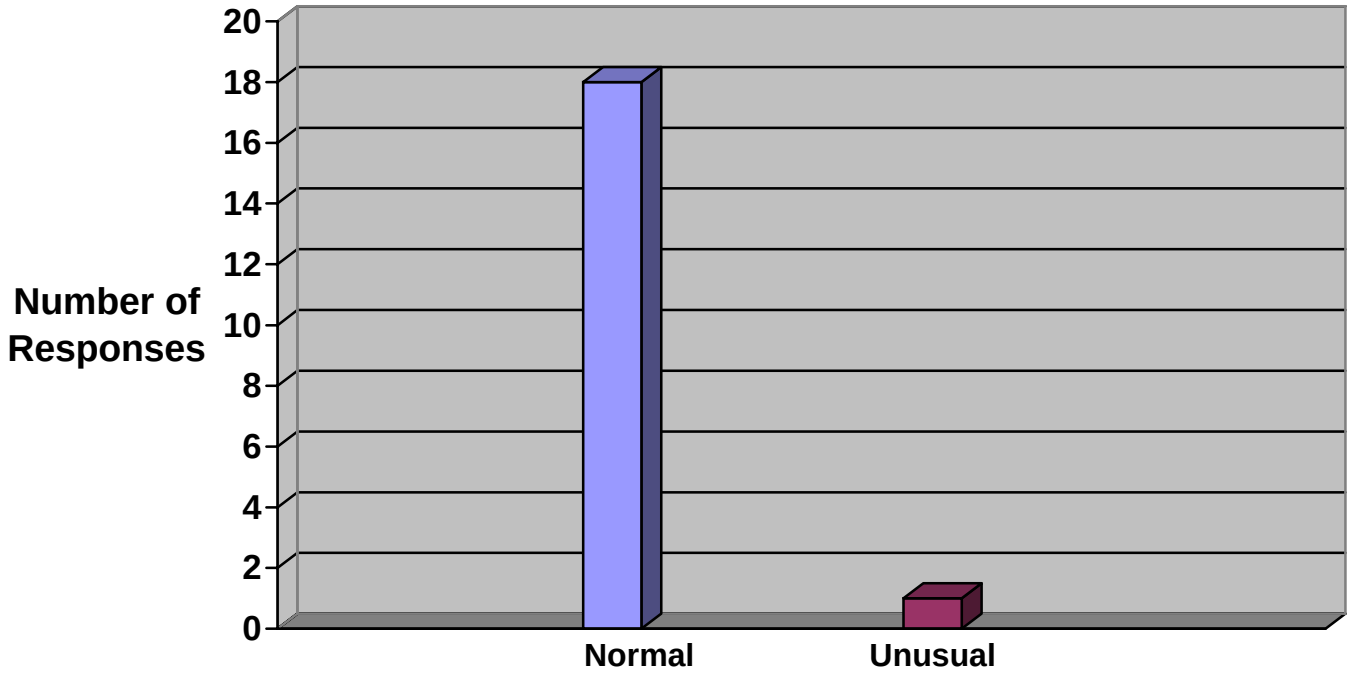
Critical Element: Length of service

Figure 20.- How long have you worked for your current employer as a nursing assistant?



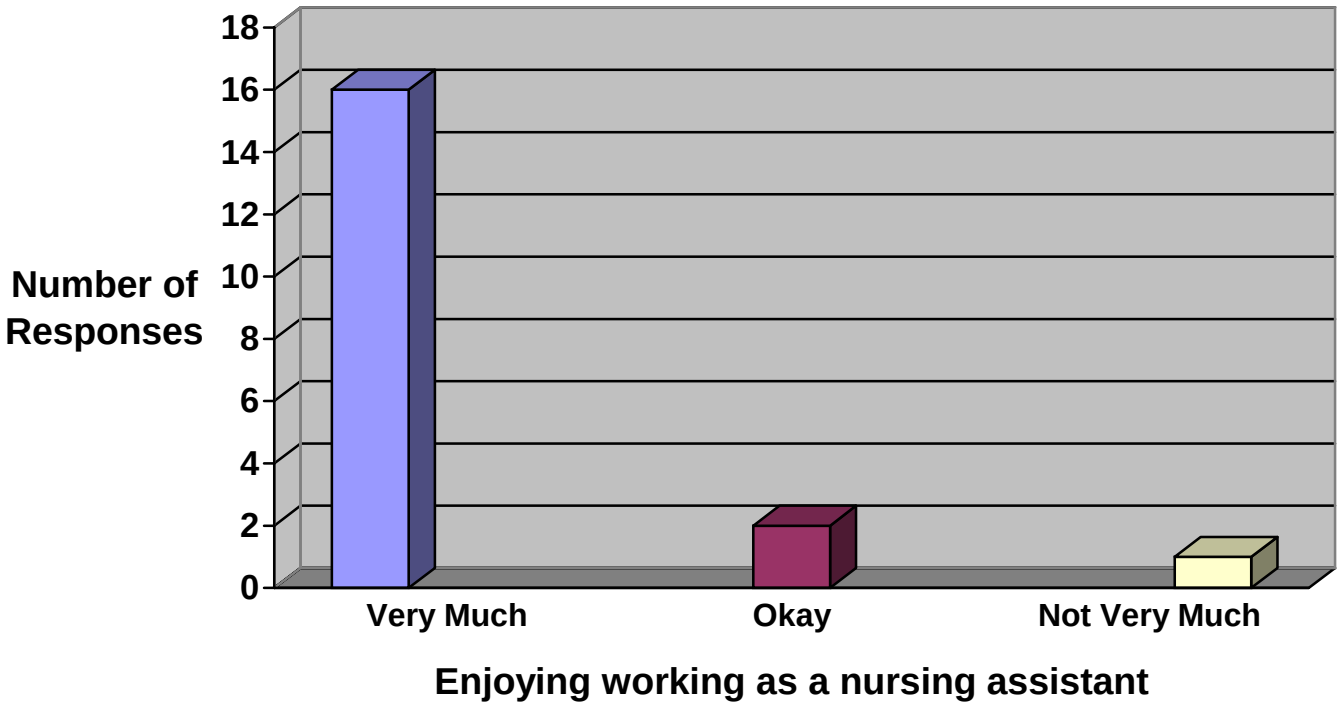
Critical Element: Number of residents cared for at time of injury

Figure 21.- How many residents do you normally care for on one shift?



Critical Element: Asking for assistance to lift, transfer, or reposition a resident

Figure 22.- Is it normal or unusual for you to ask for help when attempting to lift, transfer or reposition a resident?



Critical Element: Job satisfaction

Figure 23.- Do you enjoy working as a nursing assistant?

The data analysis to this point was not useful. The critical elements outlined earlier have been analyzed through the classification of risk severity and probability. Classification of each critical element on the risk assessment matrix identifies the risk severity and probability in relationship to nursing assistants injured when lifting, transferring, or repositioning nursing home residents. Risk severity has been classified according to the responses the nursing assistant's gave to question number 21 on the questionnaire located in Appendix B. Appendix B includes the response given by each nursing assistant for question number 21, in-addition to the critical element that best represents the nursing assistants response. The question asked each of the 19 nursing assistants "If you had your own nursing home what would you do to prevent back injuries among nursing assistants"? If at-least one nursing assistant's suggestion was similar to a specific critical element evaluated then the critical element was to be considered "marginal" at the very least within risk severity ranking. If at least two nursing assistants recommended the same critical element as their suggestion for preventing back injuries then the risk severity was considered "critical". If at least three or more nursing assistants recommended the same critical element in question number 21 then the critical element was to be considered "catastrophic" at the very least. As for evaluating probability, each question on the questionnaire represents a specific critical element. The scale for evaluating probability on the risk assessment matrix for each critical element includes plotting the answer selected most often by the 19 nursing assistants for questions 1-20 on a scale from 0-19:

Table 1.- Critical Element: Task being completed when injury occurred

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)				X	

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 1 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answer selected most often in question number 1 was (E). (assisting resident to walk when resident began to fall). (E) was answered a total of 7 times out of a possible score of 19. Therefore, probability received a "remote" ranking.

Corrective action: Operation permissible-needs no reduction

Table 2.- Critical Element: Similar incidents in the past (accident repeaters)

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)	X				

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 2 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answer selected most often in question number 2 was (B). (No). (B) was answered a total of 17 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Operation permissible-needs no reduction

Table 3.- Critical Element: Time of day injury occurred

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)				X	

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 3 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answers selected most often in question number 3 was (A) and (B). (No). (A) and (B) were answered a total of 6 times each out of a possible score of 19. Therefore, probability received a "Remote" ranking.

Corrective action: Operation permissible-needs no reduction

Table 4.- Critical Element: Type of shift on which injury occurred

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)	X				

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 4 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answer selected most often in question number 4 was (B). (Fixed work shift). (B) was answered a total of 18 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Operation permissible-needs no reduction

Table 5.- Critical Element: Number of hours worked the day injury occurred

	Probability				
Risk Severity	Frequent 15-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)		**X**			
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, 1 of them made reference to question number 5 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a “marginal” ranking. The answer selected most often in question number 5 was (B). (4-8 hours). (B) was answered a total of 12 times out of a possible score of 19. Therefore, probability received a “probable” ranking.

Corrective action: Written, time-limited waiver endorsed by management required

Table 6.- Critical Element: Impact of company policy

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)	**X**				
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, one of them made reference to question number 6 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "marginal" ranking. The answer selected most often in question number 6 was (A). (Yes). (A) was answered a total of 19 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Written, time-limited waiver endorsed by management required

Table 7.- Critical Element: Use of mechanical lift

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)	**X**				
Marginal(1)					
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, two of them made reference to question number 7 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "critical" ranking. The answer selected most often in question number 7 was (B). (No). (B) was answered a total of 18 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Risk reduction required immediately

Table 8.- Critical Element: Availability of mechanical lifts

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)	X				

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 8 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answer selected most often in question number 8 was (A). (Yes). (A) was answered a total of 19 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Operation permissible-needs no reduction

Table 9.- Critical Element: Training on how and when to use mechanical lift

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)	**X**				
Marginal(1)					
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, two of them made reference to question number 9 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "critical" ranking. The answer selected most often in question number 9 was (A). (Yes). (A) was answered a total of 19 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Risk reduction required immediately

Table 10.- Critical Element: How long ago was training on mechanical lifts

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)			**X**		
Marginal(1)					
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, two of them made reference to question number 10 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "critical" ranking. The answer selected most often in question number 10 was (B). (More than 1 year ago). (B) was answered a total of 11 times out of a possible score of 19. Therefore, probability received a "occasional" ranking.

Corrective action: Written, time-limited waiver endorsed by management required

Table 11.- Critical Element: Exercise

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)		X			

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 11 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answer selected most often in question number 11 was (A). (Yes). (A) was answered a total of 13 times out of a possible score of 19. Therefore, probability received a "probable" ranking.

Corrective action: Operation permissible-needs no reduction

Table 12.- Critical Element: Stretching

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)	**X**				
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, one of them made reference to question number 12 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "marginal" ranking. The answer selected most often in question number 12 was (B). (No). (B) was answered a total of 18 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Written, time-limited waiver endorsed by management required

Table 13.- Critical Element: Training on safe lifting or good body mechanics

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)			**X**		
Critical(2)					
Marginal(1)					
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, five of them made reference to question number 13 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "catastrophic" ranking. The answer selected most often in question number 13 was (C). (1-2 years ago). (C) was answered a total of 8 times out of a possible score of 19. Therefore, probability received a "occasional" ranking.

Corrective action: Risk reduction required immediately

Table 14. Critical Element: Gait belt use

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)		**X**			
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, one of them made reference to question number 14 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "marginal" ranking. The answer selected most often in question number 14 was (B). (No). (B) was answered a total of 14 times out of a possible score of 19. Therefore, probability received a "probable" ranking.

Corrective action: Written, time-limited waiver endorsed by management required

Table 15.- Critical Element: Hours per week at time of injury

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)		X			

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 15 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answer selected most often in question number 15 was (B). (20-40 hours per week). (B) was answered a total of 14 times out of a possible score of 19. Therefore, probability received a "probable" ranking.

Corrective action: Operation permissible-needs no reduction

Table 16.- Critical Element: Hours worked typical

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)	**X**				
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, one of them made reference to question number 16 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "marginal" ranking. The answer selected most often in question number 16 was (A). (Typical). (A) was answered a total of 19 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Written, time-limited waiver endorsed by management required

Table 17.- Critical Element: Length of service

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)					
Negligible(0)			X		

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, none of them made reference to question number 17 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "negligible" ranking. The answer selected most often in question number 17 was (D). (2 years or more). (D) was answered a total of 9 times out of a possible score of 19. Therefore, probability received a "occasional" ranking.

Corrective action: Operation permissible-needs no reduction

Table 18.- Critical Element: Number of residents cared for at time of injury

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)		**X**			
Critical(2)					
Marginal(1)					
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, 4 of them made reference to question number 18 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "catastrophic" ranking. The answer selected most often in question number 18 was (B). (8-16 residents). (B) was answered a total of 13 times out of a possible score of 19. Therefore, probability received a "probable" ranking.

Corrective action: Risk reduction required immediately

Table 19.- Critical Element: Asking for assistance to move a resident

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)	**X**				
Critical(2)					
Marginal(1)					
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, five of them made reference to question number 19 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "catastrophic" ranking. The answer selected most often in question number 19 was (A). (Normal). (A) was answered a total of 18 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Risk reduction required immediately

Table 20.- Critical Element: Job satisfaction

	Probability				
Risk Severity	Frequent 16-19	Probable 12-15	Occasional 8-11	Remote 4-7	Improbable 0-3
Catastrophic(3)					
Critical(2)					
Marginal(1)	**X**				
Negligible(0)					

Corrective action key:

Risk reduction required immediately
Written, time-limited waiver endorsed by management required
Operation permissible-needs no reduction

Risk Severity= The total number of nursing assistants that referred to the above critical element as a method for preventing back injuries to nursing assistants in question number 21 on the nursing assistant questionnaire in Appendix A.

Probability= The combined total for the answer selected most often by the 19 nursing assistants on the nursing assistant questionnaire that pertains to the critical element identified in this table.

Source: Bauer, 1994

Risk assessment outcome: Of the 19 nursing assistants responding to question number 21, one of them made reference to question number 20 as a method or strategy for preventing back injuries to nursing assistants. Therefore, the risk severity received a "marginal" ranking. The answer selected most often in question number 20 was (A). (Very much). (A) was answered a total of 16 times out of a possible score of 19. Therefore, probability received a "frequent" ranking.

Corrective action: Written, time-limited waiver endorsed by management required

The majority of injuries occurred when assisting a resident to walk. Other lifting, transferring or repositioning task received the second highest responses, and repositioning residents while they are in a chair caused the least number of injuries. These results might be due to the exposure time being much greater when assisting a resident to walk rather than a repositioning task in a chair. Most employees answered that they have not had a similar accident in the past. These results tell us very little, other than most did not have a similar accident in the past. Most of the injuries occurred between the hours of 8AM and 4PM. No injuries occurred after midnight through 8AM. These results are consistent with those found in figure 2 which represents the time of day injuries occurred within the Pennsylvania Healthcare Association data. Most residents are bedded down and exposure is lowest in the evening hours of 8PM through 8AM and exposure is highest when the interaction is greatest from 8AM through 4PM. A greater number on nursing assistants indicated that they were injured near the latter end of the shift than at the beginning. While the fewest indicated they had worked 8-16 hours the day they were injured. These results might indicate that overtime was not a root causal factor within the three nursing homes. Injuries caused by frequent lifting tasks can be due to the cumulative nature of the job, therefore, most of the injuries occurred at the end of the shift, rather than the beginning of the shift. Of all those injured only one nursing assistant used a mechanical lift. All of the nursing assistants indicated that they were aware of their company having a policy on using resident transfer equipment and that the equipment was easy to find. These results might indicate a lack of enforcement of the company policy to require nursing assistants to use the lifts. All the nursing assistants reported that they had been trained on how and when to use a mechanical lift. The

majority of them also reported that the training they received had been more than 1 year ago. This may indicate that the frequency of this training might not be enough to provide them with the skill and confidence necessary when using the equipment. The majority of nursing assistants indicated that they do not stretch before completing a resident lifting, transferring or repositioning task. These results could indicate that not stretching before any physical lifting task has a relationship with nursing assistants being injured. The majority of nursing assistants injured where not injured within the first 6 months of hire. As the length of service increases so does the frequency of injuries. This is consistent with the data provide in figure 1 by the Pennsylvania Healthcare Association.

Discussion and Recommendations

The following critical elements did not require any corrective action within the risk assessment outcome and will not necessitate any recommendations:

- Task being completed when injury occurred;
- Similar incidents in the past (accident repeaters);
- Time of day injury occurred;
- Type of shift on which injury occurred;
- Availability of mechanical lifts;
- Exercise;
- Hours per week worked at time of injury;
- Length of service;

The direct or indirect root causal factor for each of the questions on the nursing assistant questionnaire requiring either: risk reduction required immediately; or a written, time-limited waiver endorsed by management, as it relates to a critical element, are direct

result of the failures within the system. These root causal factors include the following recommendations in Table 21:

Table 21- Root Causal Factors and Recommendations

Critical Element	Root Cause	Corrective Action	Recommendations
Number of hours worked the day injury occurred	Indirect – failure within management system	Written, time-limited waiver endorsed by management required	The answer selected most often was 4-8 hours into shift. Therefore, special precautions must be taken to reduce the biomechanical stresses that accumulate from resident handling tasks.
Impact of company policy	Indirect – failure within management system	Written, time-limited waiver endorsed by management required	A policy for lifting, transferring and repositioning of residents must be comprehensive and enforced at all times.
Training on how and when to use a mechanical lift How long ago training was conducted on mechanical lifts	Indirect – failure within management system	Risk Reduction required immediately Written, time-limited waiver endorsed by management required	The majority of employees stated that they did not use a mechanical lift when they were injured and were trained on mechanical lifting equipment more than 1 year ago. Increase the frequency of mechanical lift training to twice per year in first year of employment and once per year thereafter. Require a specialist for lifting equipment to

			be on each shift for staff support.
Stretching	Indirect – failure within management system	Written, time-limited waiver endorsed by management required	The majority of nursing assistants said that stretching was not part of their daily routine. Management should endorse stretching at the beginning of every shift. Stretching produces blood flow through the muscles and ligaments which will help to prevent lifting injuries.
Gait belt use	Indirect – failure within management system	Written, time-limited waiver endorsed by management required	Management needs to train employees on gait belt use and enforce their use when a resident is not 100% weight barring but does not require a mechanical lift.
Hours per week worked at time of injury	Indirect – failure within management system	Written, time-limited waiver endorsed by management required	The majority of employees stated that the number of hours they worked the week they were injured was 20-40 hours. The root cause is due to the cumulative biomechanical stresses of resident lifting tasks. Therefore, special precautions must be taken to reduce the biomechanical stresses that accumulate from resident handling tasks.

Job satisfaction	Indirect – failure within management system	Written, time-limited waiver endorsed by management required	Job satisfaction is a very critical element when attempting to motivate employees. Special emphasis must be placed on management's commitment to improving workplace safety and for continuously showing employees that they are appreciated.
Training on safe lifting techniques or good body mechanics	Indirect – failure within management system	Risk reduction required immediately	The majority of the employees stated they had not been trained on safe lifting techniques or good body mechanics over 1-2 years ago. This requires an increased training frequency of every 6 months for new hires and yearly thereafter at a minimum.
Number of residents cared for at time of injury	Indirect – failure within management system	Risk reduction required immediately	The majority of the employees injured said they cared for 8-16 residents per shift. It is recommended that additional part-time help be considered during the last 4 hours of the shift since this is the time in-which most of the lifting and transferring injuries occurred.

Asking for assistance to lift, transfer, or reposition a resident	Indirect – failure within management system	Risk reduction required immediately	Management must require and enforce that a minimum of two nursing assistants for any manual repositioning or transfer task.

The researcher attempted to assess risk severity and probability for the critical elements evaluated to identify the root causal factors that contributed to the injuries among nursing assistants working in three long term care facilities in northwestern Pennsylvania. An ergonomics program to reduce the number of injuries sustained by nursing assistants in nursing homes is not just about bringing resident lifting equipment through the door of the nursing home. Management support, encouragement, enforcement and having the right tools available can make an impact on reducing these kinds of injuries. If the training the employees receive is not conducted frequently enough to remind employees of the proper techniques, best practices available and expectations of management, a resident lift program will not achieve the goal of reducing injuries. Secondly, employees that ask for assistance and receive help are preventing a possible injury simply because two is safer than one. In other words, if a certified nursing assistant does not receive help from another nursing assistant because there is not enough manpower available then the risk of injury increases. The researcher was not intending to suggest that more employees should be hired to prevent injuries. Scheduling of staffing levels highest when exposure potential increases is a best practice that cannot be overlooked in-addition to a well educated workforce.

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Appendix A

Nursing Assistant Questionnaire

1. What task where you completing when your injury occurred?

   A. Repositioning resident while they are in bed.
   B. Repositioning resident while they are in a chair
   C. Bathing resident
   D. Assisting resident out of bed
   E. Assisting resident to walk when resident began to fall
   F. Other lifting, transferring or repositioning task

2. Have you had a similar incident in the past?

   A. Yes
   B. No

3. What was the approximate time of day your injury occurred?

   A. 8 AM-12 PM
   B. 12 PM-4 AM
   C. 4 PM-8 PM
   D. 8 PM-12 AM
   E. 4 AM-8 AM

4. At the time of your most recent injury what did you work?

   A. Rotating shift work
   B. Fixed shift work
   C. Called in unscheduled

5. How many hours had you worked the day you were injured?

   A. 0-4 hours
   B. 4-8 hours
   C. 8-12 hours
   D. 12-16 hours

6. Does the company you are employed by have a policy on using resident lifting equipment?

   A. Yes
   B. No

7. Did you use a mechanical lift when your injury occurred?

    A. Yes
    B. No

8. Are mechanical lifts available and easy to find for moving residents in your facility?

    A. Yes
    B. No

9. Have you been trained on how and when to use a mechanical lift by your current employer?

    A. Yes
    B. No

10. If yes, how long ago did you have training on mechanical lifts?

    A. Less than 1 year ago
    B. More than 1 year ago

11. Do you exercise for at least 15 minutes, 3 days per week?

    A. Yes
    B. No

12. Do you stretch before completing a resident lifting, transferring or repositioning task?

    A. Yes
    B. No

13. Have you been trained in safe lifting techniques or good body mechanics in the past?

    A. 0-6 months
    B. 6-12 months
    C. 1-2 years
    D. Have not had this type of training

14. Are gait belts used regularly in your facility?

    A. Yes
    B. No

15. How many hours a week did you normally work at the time your injury occurred?

    A. Less than 20 hours per week.
    B. 20-40 hours per week.
    C. 40-50 hours per week.
    D. 50 hours or more per week.

16. At the time of your injury was the number of hours worked typical or unusual?

    A. Typical
    B. Unusual

17. How long have you worked for your current employer?

    A. 0-6 months
    B. 6 months – 1 year
    C. 1-2 years
    D. 2 years or more

18. How many residents do you care for on one shift?

    A. 1-8
    B. 8-16
    C. 16-24
    D. 24 or more

19. Is it normal or unusual for you to ask for help when attempting to lift, transfer or reposition a resident?

    A. Normal
    B. Unusual

20. Do you enjoy working as a nursing assistant?

    A. Very much
    B. Okay
    C. Not very much

21. If you had your own nursing home what would you do to prevent back injuries among nursing assistants? Explain briefly.

Personal Information: Weight:____ Height____ Sex: (male/female)

Age at the time your injury occurred:____

Appendix B

Nursing Assistant Responses to Question # 21

Response 1:

Have more team-work. In-services on preventing back injuries and lifting techniques and body mechanics once a year.

Critical Element:

- Ask for assistance to lift, transfer, or reposition a resident
- Training on safe lifting techniques or good body mechanics

Response 2:

More employees needed.

Critical Element:

- Number of residents cared for at time of injury

Response 3:

Always be fully staffed.

Critical Element:

- Number of residents cared for at time of injury

Response 4:

Use mechanical lifts, have yearly in-services on them and safe lifting techniques and good body mechanics.

Critical Element:

- Training on how and when to use mechanical lifts
- How long ago training was conducted on mechanical lifts
- Training on safe lifting techniques and good body mechanics

Response 5:

Have in-service meetings on lifting techniques and good body mechanics every 6 months, because of the new employees coming in and just to remind everyone the ways to lift so no one gets hurt.

Critical Element:

- Training on safe lifting techniques or good body mechanics

Response 6

I would have better communication on resident needing 1 person, 2 person, or mechanical lifts.

Critical Element:

- Training on how and when to use mechanical lifts
- Ask for assistance to lift, transfer, or reposition a resident

Response 7

Better training for new aides on the right way to lift safely. Most places have a policy if a resident is falling you are suppose to ease them to the floor or let them fall. But it is instinct to catch a person so they don't get hurt. There should be something to do about this.

Critical Element:

- Training on safe lifting techniques or good body mechanics
- Gait belt use

Response 8

More help use two.

Critical Element:

- Asking for assistance to lift, transfer, or reposition a resident

Response 9

Enforce no lift policy.

Critical Element:

- Impact of company policy

Response 10

Have more help.

Critical Element:

- Asking for assistance to lift, transfer, or reposition a resident
- Number of residents cared for at time of injury

Response 11

Make sure assistants use 2 person transfer whenever possible.

Critical Element:

- Asking for assistance to lift, transfer, or reposition a resident

Response 12

Make sure training on lifting equipment is completed every year

Critical Element:

- How long ago training was conducted on mechanical lifts

Response 13

Teach proper lifting techniques

Critical Element:

- Training on safe lifting techniques or good body mechanics

Response 14

I would require nursing assistants to wear back support while on duty

Critical Element:

- Training on safe lifting techniques and good body mechanics

Response 15

Have more help or at least try to have more employers working on a floor

Critical Element:

- Number of residents cared for at time of injury

Response 16

Get out of nursing

Critical Element:

- Job satisfaction

Response 17

I would have nursing staff stretch at the beginning of each shift and train on safe lifting procedures

Critical Element:

- Stretching
- Training on safe lifting techniques or good body mechanics

Response 18

I would have more staff so you don't have to wait 10 minutes for help and I would not ask employees to work 16 hours in one day without giving them the next day off

Critical Element:

- Asking for assistance to lift, transfer, or reposition a resident

- Number of hours worked the day injury occurred

Response 19

You can’t prevent them, people will do what they want

Critical Element:

- Impact of company policy

The Institutional Review Board for the Protection of Human Subjects
West Virginia University

Date: February 04, 2000

M E M O R A N D U M

TO: James Culligan
IMSE-CEMR

FROM: Marian J. Turner
IRB/ACUC Administrator

RE: HS #14713-E; A Root Cause Analysis of Nursing Assistant Injuries Which Occur While Moving, Transferring, or Lifting Nursing Home Residents

The Institutional Review Board for the Protection of Human Subjects has reviewed and approved the Application for Exemption for the above named research project.

This exemption approval will remain in effect only on the condition that the research is carried out *exactly* as described in the Application.

Best wishes for the success of your research.

MJT/baw

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Equal Opportunity / Affirmative Action Institution

Vita

James Culligan was born in Pittsburgh, PA on June 13, 1966. He enlisted in the U.S. Air Force in 1986 an received an honorable discharge in 1990. Thereafter, he graduated from Slippery Rock University with a B.S. degree in 1992. In 1993 he was employed by Hancor, Inc. as a Safety/Environmental Specialist. Currently, he is employed by Gilbert's Insurance Agency, as an Account Executive. He is married and has two boys.