

Safe Patient Handling: Better Patient and Staff Safety Economically Justified

Alan Bingham
Senior Product Manager
AliMed, inc

Abstract

The argument for safe patient handling and No-Lift policies is widely accepted based on both patient and staff injury reduction. However, understanding the factors that dictate the metrics, and the costs involved is less well articulated. Moreover, clinicians seldom have the training, or background, to justify the investment as a business decision with a Return on Investment (ROI), and this often leads to equipment investment being deferred when in point of fact it should be implemented.

This paper uses median values on costs, clinical staff injury rates, salaries and loss time as well as information from many reliable sources (such as CDC), and presents a composite financial value proposition that can vary from location to location, but serves as an indicator of the financial value of safe patient handling investment.

The Problem:

For nursing staff the patient handling task is a high injury risk activity in which they must engage. People are difficult to handle and often can be uncooperative or unconscious.

There is no realistic weight limit on what a nurse is allowed to, or can lift. The US Coast Guard in 2010 set the 90th percentile of male and female weight (for rescue purposes so they can equip) at 290lbs. Most metrics used in healthcare fall below this weight.

Patient handling includes such functions as boosting a patient up in the bed when they slip towards the foot of the bed, turning them over for care or pressure ulcer prevention, helping them up from bed to a chair or mobility device and transferring them, lifting them when unconscious, lifting them from a floor after a fall and sitting them up. Most frequently, boosting up the bed and turning are performed by 2 people and the position adopted is with extended arms at waist level.

The results of this activity have been tabulated as:

- a) Musculoskeletal (MSD) injury accounted for over 32% of injuries in healthcare facilities that resulted in lost days (402,700 cases in 2004)ⁱ
- b) The trunk (shoulder & back) were the most impacted body parts comprising 35.5% of all cases
- c) Sprains and strains were recorded as 525,000 instances representing 47% of all cases
- d) The median number of lost days from work because of MSD cases was 10 days with almost 1/4th requiring >31 daysⁱⁱ.

Add to this the reality that:

- a) More than 30% of the US population is now considered obese by the CDC, including professional caregivers (number on the increase).
- b) More than 66% of the population is overweight (in the past 5 years there is a 50%+ increase in those 100lb overweight and a 75%+ increase in those =>100lbs overweight).

- c) The workforce is aging – (median nurse age is 46.8 years)
- d) The delivery of healthcare, and the costs of (workers' compensation) insuring are rising

The Commercial reality of these factors is that:

- a) 38% of nursing staff suffer patient handling injuries
- b) 48% Have chronic pain from patient handling related injuries
- c) 70% of injuries are lumbar spine located
- d) 40% of nursing staff identify the physical demands as the number 1 problem with the profession
- e) 47% of nursing staff have considered leaving the profession because of physical demands
- f) 12% of nursing staff do leave because of back injuries

And this has an impact on the cost viability structure of healthcare delivery facilities because it translates into:

- Reduced revenues and cash flows
- Staff turnover and the reputation in a closed community for high staff turnover
- Cost to recruit and replace staff – permanent and casual
- Pressure from staff for improvement coupled with a morale drop
- Cost of Workers' compensation based on 'Experience Ratios'

- Legislation & Compliance including JCAHO citations
- Spiraling costs to administer

The Evidence that ‘No-Lift’, Safe Patient Handling, Programs work

Case Study Exampleⁱⁱⁱ

NIOSH longitudinal study of Nursing home back strain injuries from lifting patients, before and after safe mechanical lifting program, involved 6*LTC facilities, 3 year pre-intervention / 3 year post intervention of 2,646 nursing staff.

Claims reduced 66%, Injury rates decreased 60%, lost workday rates reduced 66%, workers’ compensation costs reduced 51%.

Staff turnover, in the study, went from >300% annually to zero two years post introduction of mechanical lifting devices.

Ergonomically, we know that:

OSHA recommends manual lifting of patients be minimalized – “*eliminated where feasible*”

Marras, et al (1999), Garg & Owen (1992), and Zhuang et al (2000) after extensive research have all concluded that even two caregivers could not lift a patient manually without physical overload stress.

Additionally, there are generally accepted ergonomic guidelines published by several governmental bodies (OSHA, etc.) that define maximum human weight loadings for lifting, pulling and pushing.

The evidence is so compelling that the states of WA, TX, MD, NY, OH, RI, NJ have healthcare workers no-lift legislation, and seven other states have drafted similar legislation.

Minimal Equipment Requirements^{iv} to Effect Safe Patient Handling in the Context of the ‘Spirit of No-Lift’

1 electric / mechanical lift per 10 beds

- available *and* servicable with staff trained *and* ready (willing to use) and appropriate slings.

Use for -

- Lifting fallen patients from the floor
- Lifting patients who cannot assist in the transfer to mobility aids
- Lifting patients who cannot assist in transfer for toileting, bathing, etc.

Also, each bed should have available in immediate vicinity:

- Slider sheets / boards for lateral transfer
- Booster, to boost up the bed / Turner to assist in turning patients.

Cost to Implement a Safe Patient Handling, No-Lift Policy

Investment:

Based on the NIOSH recommendation of 1 lift per 10 beds (as a ‘*rule-of-thumb*’)

Assume:

- 1 * 600 lb capacity lift per 10 beds
- Each bed equipped with No-Lift Booster & Turner
 - Replacements every 6 months for Booster, Turner & lifter slings

Savings:

- Workers' compensation premium reductions
- Fewer lost days – fewer replacement staff
- Fewer injuries
- Lower costs to provide care
- Fewer recruitment costs

These then translate into the following values based on national median metrics:

Assume a nursing ratio of 1:8 for a nursing home and 1:6 for a hospital^v

Mean (non loaded) national salary nurses^{vi}

- Nursing homes \$48,220
- Hospitals \$53,450

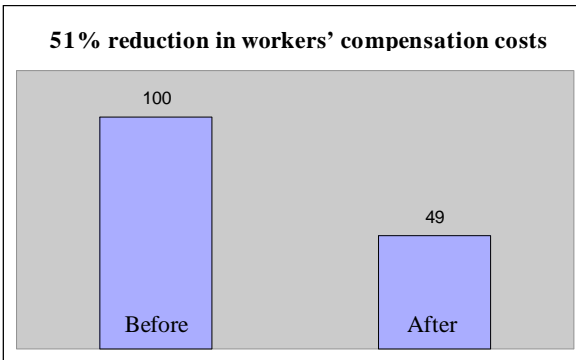
Workers' compensation premium (national median rates)

- Nurse (ea) in nursing home \$5,088
- Nursing to handle 10 beds (based on nurse/resident ratio) \$6,106
- Nurse in hospital \$1,367
- Nursing to handle 10 beds (based on nurse /patient ratio) \$2,317

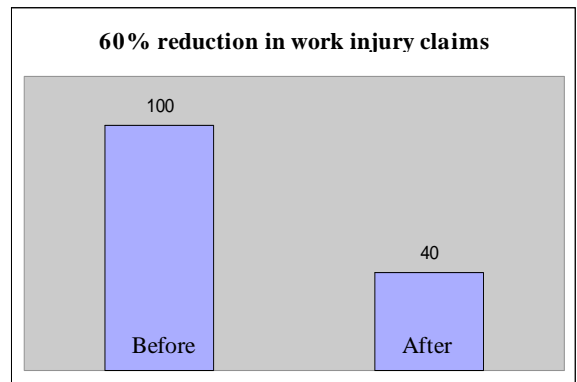
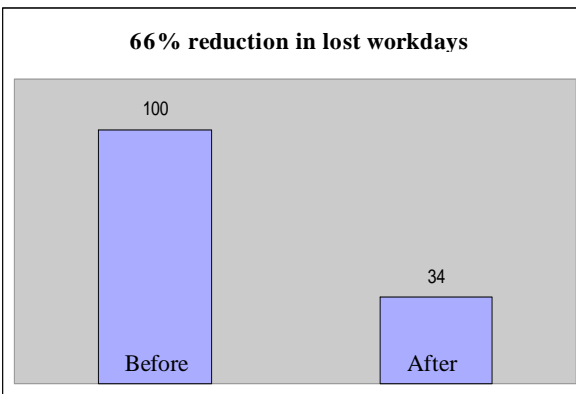
Cost to replace a nurse \$42,000^{vii}

Mean back injury cost per nurse \$12,500^{viii}

Transposing the Evidence onto the Metrics



(NIOSH longitudinal study of nursing home back strain injuries, before & after a safe mechanical lifting program, involving 6 facilities, 6 years and 2,646 nursing staff)



Methodology for Cost Benefit / ROI calculations

The calculations are based on a 10 bed complex to enable scalability by facilities who utilize the assumptions in this paper to extrapolate easily to their facility. A 100 bed complex, adopting this paper's premises would simply multiply by 10 to appreciate the possible impact on their full facility.

Lease is used and the factor is based on a 2010 multiplier. Multipliers change daily, and the .02617 factor will change from day to day, and by leasing company. The multiplier used here was valid at the date of use but is indicative.

The median values used are those that were identified in 2010. The probability that they have varied from the date they were published is high but they can be reliably used as benchmarks. Because they are median values, the actual values used will vary from state to state, and specific values can vary within states. While these are all indicative and are used as benchmarks, facilities can insert their own local values into this matrix and develop specific values should they so desire.

Workers' compensation rates are based on published state rate median values, which are regulated, however, experience ratios can impact the loading on the rates and may trigger at differing time periods, and for different values. They are also subject, according to payor risk profiles and the identification of the safe patient handling plan along with its impact to the insurance payor. For these calculations we have used experience ratio factors from several State Funds, not commercial payors.

1) Calculations using (5 year with \$1 residual) lease to acquire equipment based on Nursing Home metrics per 10 beds.

Nursing homes Investment	Year 1	Year 2	Year 3	Year 4	Year 5	Total 5 yrs
Lease on one 450 lb lift for 10 beds with cost price of \$2,420. Rate .02617	\$776	\$776	\$776	\$776	\$776	\$3,880
Consumables for 10 beds: 20 ea booster, turner & s/sheets & 4 slings	\$1,400	\$1,400	\$1,400	\$1,400	\$1,400	\$7,000
Total Investment	\$2,176	\$2,176	\$2,176	\$2,176	\$2,176	\$10,880
Less Savings						
Less workers compensation premium reductions (1:8 staffing ratio)	No reduction	5% of \$6,106 or \$305	5% of \$5,801 or \$290	10% of \$5,511 or \$551	No reduction Premium \$3,127- saving \$2,979	\$2,555
\$ Reductions cumulative	No reduction	\$305	\$795	\$1346	\$1,346	\$3,792
Recruitment cost 12% attrition reducing to 2% (net 10%) with replacement cost at \$42,000 1.2 nurses per 10 beds	\$5,040 (represents annual cost to replace 1.2 staff per 10 beds)	\$5,040	\$5,040	\$5,040	\$5,040	\$25,200
Less days lost due to injury (cal at 465 days per 10,000* workers) .0558 multiplier*	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	
Less direct injury cost (\$12,500 per incident) including lost time - Mean time away 7 days = 3 incidents	(\$37,500-\$3,857lost time above) = (\$33,643	(\$37,500-\$3,857lost time above) = \$33,643	(\$37,500-\$3,857lost time above) = \$33,643	(\$37,500-\$3,857lost time above) = \$33,643	(\$37,500-\$3,857lost time above) = \$33,643	\$168,215
Cost reductions	\$38,683	\$38,988	\$39,478	\$40,029	\$40,029	\$197,207
Net saving	\$36,507	\$36,812	\$37,302	\$37,853	\$37,853	\$186,327

2) Calculations using (5 year with \$1 residual) lease to acquire equipment based on Nursing Home metrics per 10 beds.

Hospitals	Year 1	Year 2	Year 3	Year 4	Year 5	Total 5 yrs
Lease on one 450 lb lift for 10 beds with cost price of \$2,420. Rate .02617	\$776	\$776	\$776	\$776	\$776	\$3,881
Consumables for 10 beds: 20 ea booster, turner & s/sheets & 4 slings	\$1,400	\$1,400	\$1,400	\$1,400	\$1,400	\$7,000
Total Investment	\$2,176	\$2,176	\$2,176	\$2,176	\$2,176	\$10,880
Less workers compensation premium reductions (1:6 staffing ratio) at \$1,367 per nurse or \$2,280 to cover nursing for 10 beds	No reduction	20% of \$2,280 is \$456	20% of \$1,822 is \$365	20% of \$1,457 is \$290	No reduction Premium saving	
\$ Reductions cumulative	No reduction	\$458	\$823	\$1,113	\$1,113	\$3,507
Recruitment cost 12% attrition reducing to 2%(net 10%) with replacement cost at \$42,000 1.2 nurses per 10 beds	\$5,040 (represents annual cost to replace 1.2 staff per 10 beds)	\$5,040	\$5,040	\$5,040	\$5,040	\$25,200
Less days lost due to injury (cal at 465 days per 10,000* workers) .0558 multiplier*	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	20.3 days \$190 / day \$3,857 Used below	
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Cost reductions	\$38,683	\$39,141	\$39,506	\$39,796	\$39,796	\$196,922
Net saving	\$36,507	\$36,965	\$37,330	\$37,620	\$37,620	\$186,042

Conclusions:

Safe patient handling uses mechanical devices to reduce the risk of injury to staff and is so doing has excellent commercial / financial merit apart from the humanistic and legal issues. The ROI is significant when the national median metrics are used in the cost/benefit calculus. Even at the extreme, if the ROI was only half as good as the national median metrics show, then it would still be a good business (financial) decision.

Factors such as the availability of staff to replace those lost to staff turnover as a result of injury or simply leaving because of back injury risk, have not been considered, nor has any potential for litigation arising from injury nor productivity gains from increased morale ad/or efficiency.

These figures used are indicative and there is no guarantee that they can be achieved in any facility, regardless of geographic location or type and quantity of mechanized equipment involved. These cost benefit values are based on 2010 factors and values, and are intended as an evidence-based benchmark and a demonstration of ROI.

About the author – Qualifications and disclosures

Alan Bingham is a professional marketing manager in healthcare and is currently the Senior Product Manager at AliMed, inc., a major manufacturer and master distributor of healthcare and ergonomic products. He manages the product portfolio for Rehabilitation, Patient & Staff Safety and Ergonomics. His background includes extensive work injury rehabilitation and workers' compensation with both insurance providers and payors.

Educated at the Universities of Sydney (Liberal Arts), University of Phoenix (Management), NSW Institute of Technology (Management), Sydney Technical College (Systems Analysis), and numerous ongoing educational courses, he is also a member of the Association of Safe Patient Handling Professionals.

References

ⁱⁱ Thomas R Water, PhD: An Overview of Efforts Aimed at Promoting Safe Patient Handling & Movement Practices, NIOSH 2007

ⁱⁱ Bureau of Labor & Statistics

ⁱⁱⁱ James W Collins, PhD,MSME; NIOSH Research on Safe Patient Marras et al, 1999 Lifting, Slip, Trip, and Fall prevention of Health Care workers; CDC/NIOSH, 2007

^{iv} NIOSH general rule of thumb – “Safe Lifting and Movement of Nursing Home Residents; DHHS by NIOSH (Booklet)

^v National Nurse organizing committee/www.nnoc.net

^{vi} www.allnursingschools.com/faqs/salaries/php & www.allbusiness.com: www.wydoe.state.wy.us: www.wcirb.org

^{vii} National Nursing organizing committee/www.nnoc.net

^{viii} Oregon OSHA Safe Patient Handling: A Worthy Investment, 2007, www.osha.oregon.gov

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