

Are hoists used effectively by carers to safely transfer people with physical disabilities?

Prepared by: Susie Mullen,
Occupational therapist
Hills Therapy Service, Sydney

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Clinical Question:

“Does the use of hoists reduce musculo-skeletal injuries amongst carers?”

Clinical Scenario:

Occupational therapists frequently prescribe hoists for carers to lift clients with a physical disability. During ongoing client appointments, it has been noted that hoists are not always used by carers (paid and unpaid) to lift clients. Reasons for this include time and space taken to set up and use the hoist and sling. Hoists are expensive pieces of equipment prescribed to ensure safe lifting and handling practises for both clients and their carers.

Summary of Key Findings:

- 4 studies were located that met the inclusion/exclusion criteria
- 0 RCT's were located
- 0 Cohort study was located
- 2 Case study pre-test/post-test were located
- Case study 1 found that the use of lifting devices reduces biomechanical stress and will subsequently decrease the occurrence of client handling related low back injuries for carers.
- Case Study 2 (pre-test/post-test) found that musculo-skeletal injuries caused by lifting and transferring clients was significantly reduced following the installation of ceiling hoists. However, rates of musculo-skeletal injuries caused by client repositioning in postural equipment did not statistically decline. Further research is needed to determine if hoists can be effective in decreasing injuries related to repositioning clients.
- 2 descriptive studies were found.

Clinical Bottom Line:

Carers using hoists to lift and transfer clients with physical disabilities will experience a reduction in client related low back injuries.

Limitation of CAT (Critically Appraised Topic)

This summary of evidence has been individually prepared and has not undergone a process of peer review.

Methodology:

Search Strategy

Using the levels of evidence as defined by NHMRC (2000) the search strategy aimed to locate the following study designs:

- Systematic Reviews and Meta-analyses
- RCT's
- Controlled trials, Cohort or case control analytic studies
- Case series: post test only; pre-test/post test
- Expert opinion including literature/narrative reviews, consensus statements, descriptive studies and individual case studies

A search was also conducted for clinical guidelines based on these levels of evidence.

Search Terms

Patient/Client: Physical Disabilities, Carers
Intervention: Hoists, Mobile and Ceiling, Lifting equipment, lifting devices
Comparison: Nil
Outcome: Safe Transfers

Sites/Resources Searched

- Healthbase –Australian guidelines
- Centre for Clinical Effectiveness
- Pubmed
- PEDro –The Physio Evidence Database
- Cochrane Library
- Johanna Briggs Institute

Inclusion/Exclusion Criteria

Inclusions

- Studies investigating the use of hoists as an intervention to safely transfer clients with physical disabilities.
- Studies investigating the use of hoists to reduce injury risk to carers.
- Studies using various types of hoists such as standing, mobile floor, electric and hydraulic, ceiling hoists
- Studies published in English

Exclusions

- Studies not in English
- Studies describing other lifting techniques or equipment and not including hoists

Results

Four relevant studies were located and categorised as shown in Table 1.

Table 1. Study designs of articles retrieved by search

Methodology of Studies Retrieved	Number Located	Source of Evidence
Clinical Practice Guidelines (Evidence Based)	0	N/A
Systematic Reviews or Meta-Analyses	0	N/A
Randomised Controlled Trials	0	N/A
Controlled trials, Cohort or case control analytic studies	0	Pubmed
Case Series: Post-test only, Pretest/Post test	2	Pubmed
Expert Opinion including literature/narrative reviews, consensus statements, descriptive studies and individual case studies	2	Pubmed

Specific Results

The case series were the only studies appraised for this summary as they represent the highest level of evidence located. The studies and appraisal findings are summarised below.

1. Zhuang Z, Stobbe T.J, Hsaio H, Collins J.W & Hobbs G.R (1999) Biomechanical evaluation of assistive devices for transferring residents. *Applied Ergonomics*, 30(4), 285-294.

Objectives of the Study:

To investigate the effects of transfer method and resident weight on the biomechanical stress to nursing assistants performing the transferring task. To identify resident transferring methods that could reduce the biomechanical stress to the nursing assistants.

Interventions investigated:

Four methods of transferring clients were compared -the use of battery powered lifters, a sliding board, a walking belt and manual lifting to transfer nursing home residents from a bed to a chair.

Study Population

Nine nursing assistants were test subjects and two elderly people participated as residents.

Primary Outcome measures

A four camera motion analysis system, two force platforms and a 3D biomechanical model were used to measure biomechanical load in each lifting device ie: battery powered lifters, sliding board, walking belt and manual lifting during transfers.

Results

Results indicate that transfer method and resident weight affect nursing assistants low back loading. The basket sling and overhead lift devices significantly reduced the nursing assistants back compressive forces during lifting. Also the use of basket sling, overhead and stand up lifters removed two thirds of the exposure to low back stress. Size of reduction and statistical significance was not described, so is unknown.

Authors Conclusion

So the use of lifting devices reduces biomechanical stress on the nursing assistants back and will therefore decrease the occurrence of resident handling related low back injuries.

2. Ronald L.A, Yassi. A, Spiegel.J, Tate R.B, Tait .D, Mozel.M.R (2002)
Effectiveness of installing overhead ceiling lift. Reducing musculoskeletal injuries in an extended care hospital unit. *American Academy Occupational Health Nursing Journal AAOHNJ 2002 March;50(3) 120-127*

Objective of the Study

The effectiveness of replacing floor lifts with mechanical ceiling lifts was evaluated in an extended care unit of a British Columbia hospital. Sixty five ceiling lifts were installed between April and August 1998.

Primary Outcome Measures

Injury data was taken from injury reports for all staff musculoskeletal injuries during a 3 year period prior to installation and 1.5 years follow up period. Rates for three pre and three post installation intervals were compared using Poisson regression.

Results

The rate of injuries caused by lifting/transferring patients was significantly reduced (58% reduction, $p=.011$) after installation but rates of all injuries and injuries caused by repositioning did not statistically decline ($p>.05$)

Authors Conclusion

Further research is needed to determine whether or not ceiling lifts can be effective for decreasing injuries related to repositioning patients.

References

Articles critically appraised for this summary of evidence

Level 4 evidence

Zhuang Z, Stobbe T.J, Hsiao H, Collins J.W, & Hobbs G.R (1999) Biomechanical evaluation of assistive devices for transferring residents. *Applied Ergonomics*, 30(4), 285-294

Ronald L.A, Yassi.A, Spiegel .J, Tate R.B, Tait.D, Mozel.M.R (2002) Effectiveness of installing overhead ceiling lifts. Reducing musculoskeletal injuries in an extended care hospital unit. *American Academy Occupational Health Nursing*,50(3), 120-127

Related articles not included in this summary

Level 5 Evidence

Edlund C.K, Harms-Ringdahl.K, Seiger.A (1998) Lift/Transfer and technical aids for persons with severe acquired brain injury. An inventory of problems. *Scandinavian Journal Caring Science* 12(3), 154-159

Williams L.E, Coleman S.B(2000) Developing a framework to evaluate patient hoists. *Professional Nurse* 15(5), 331-334.