The three-year economic benefits of a ceiling lift intervention aimed to reduce healthcare worker injuries
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
A ceiling lift intervention to reduce the risk of injury to health care workers when lifting, transferring or repositioning patients was examined. Ceiling lifts utilise a ceiling mounted track, electric motor, and a sling to provide mechanical assistance for lifting and repositioning patients. Ceiling lifts are easy to store and require less room to operate than floor lifts.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised healthcare workers who were required to lift, transfer, and reposition patients.

Setting
The setting was a hospital or institution. The economic study was carried out in British Columbia, Canada.

Dates to which data relate
The effectiveness and resource use data were gathered from 1995 to 1997 for the pre-intervention period, and from 1998 to 2001 for the post-intervention period. The price year was not reported.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was carried out retrospectively on the same sample of patients as that used in the clinical study.

Study sample
Power calculations were not reported. The number of patients or health care workers was not reported and the participating centres and patients were not described. Thus, no information on the study sample was available.

Study design
This appears to have been a retrospective comparative study. The number of participating centres was not reported. The
two groups of patients or health care workers were evaluated in two different time periods. Other details on the methods of outcome assessment were not reported.

**Analysis of effectiveness**
The outcome measure used in the analysis was the number of injury claims related to "lifting/transferring", "repositioning", "patient", "patient other", or "chronic". "Claims" were defined as injuries that were filed and accepted for compensation by the workers' compensation board (WCB) of British Columbia. The results referred only to "lifting/transferring", "repositioning" and "all" (lifting/transferring and repositioning) claims. No information on the baseline comparability of the study groups was reported. Statistical analyses were used to assess the statistical significance of differences between the pre- and post-intervention periods in terms of the number of injury claims.

**Effectiveness results**
The total numbers of claims was 65 in the pre-intervention period and 47 in the post-intervention period.

The numbers of claims associated with "lifting/transferring" were 30 (pre-intervention) and 10 (post-intervention), respectively.

The numbers of claims associated with "repositioning" were 35 (pre-intervention) and 27 (post-intervention), respectively.

The statistical analysis showed that the differences in terms of "all" and "lifting/transferring" claims were statistically significant.

**Clinical conclusions**
The effectiveness analysis showed that the implementation of the ceiling lift programme led to fewer injury claims.

**Measure of benefits used in the economic analysis**
No summary benefit measure was used in the economic evaluation because a cost-consequences analysis was carried out.

**Direct costs**
The perspective of the study appears to have been that of the institution where ceiling lifts were installed. Only costs associated with injury claims and the acquisition of ceiling lifts were considered in the analysis. The days of work lost were reported. No information on the unit costs was provided. The costs were estimated from the WCB of British Columbia. The resource use data came from the sample of patients included in the effectiveness study.

The initial investment associated with ceiling lifts was derived from a published study (Spiegel et al. 2002, see 'Other Publications of Related Interest' below for bibliographic details). The payback period to recover expenditures associated with the programme was estimated using two methods of calculating cost-savings, based on assumptions for extrapolation of pre-intervention claims costs into the post-intervention period. The first method assumed that pre-intervention claims costs in the year prior to intervention were representative of how claims costs could have continued in the absence of the intervention (post-intervention savings were estimated with reference to costs in the year prior to the intervention, i.e. 1997/1998 fiscal year). The second method assumed that the rising trend in pre-intervention claims costs would have continued through the post-intervention period in the absence of the intervention (post-intervention savings were calculated relative to costs that were extrapolated from the rising pre-intervention trend for each post-intervention interval).

The price year was not reported. Discounting was not carried out and it was unclear whether it could have been relevant.
Statistical analysis of costs
The costs were treated deterministically, but a statistical analysis was used to assess the statistical significance of differences between the pre- and post-intervention periods in terms of claims costs.

Indirect Costs
The indirect costs were not considered in the economic evaluation.

Currency
Canadian dollars (Can$).

Sensitivity analysis
Sensitivity analyses were not performed.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The statistical analysis showed that claims costs increased each year during the pre-intervention period for "all" and "lifting/transferring", while weaker trends were observed for pre-intervention "repositioning" claims costs and post-intervention claims costs. The biannual costs for "all" and "lifting/transferring" claims demonstrated a significant reversal of the increasing pre-intervention trend.

The number of days lost were increasing during the pre-intervention period for "all", "lifting/transferring" and "repositioning" claims. The post-intervention trends demonstrated a significant change from the rising number of days lost pre-intervention for "all" and "lifting/transferring" claims.

Assuming that the cost of claims remained consistent with that recorded during the 1997/1998 fiscal year, annual savings in the post-intervention period amounted to Can$137,584 with a payback period of 2.50 years.

Assuming that the claims costs would have continued to increase through the post-intervention period, annual savings in the post-intervention period amounted to Can$419,201 with a payback period of 0.82 years.

Synthesis of costs and benefits
A synthesis of the costs and benefits was not relevant since a cost-consequences analysis was performed.

Authors' conclusions
The number of claims, compensation costs and time lost decreased after the implementation of the overhead ceiling lift programme, and continued to decline for 3 years post-intervention.

CRD COMMENTARY - Selection of comparators
The selection of the comparator (usual care) was appropriate because it reflected the care delivered in the pre-intervention period, when no mechanical lifts were available. You should decide whether this is a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness data came from a retrospective study. The fact that the study groups were not evaluated concurrently
represents a strong limitation to the validity of the study, because factors other than the ceiling lift programme might have affected the clinical end point. The authors noted that such factors might include changes in staffing ratios, job stress, and regional changes in compensation legislation that took effect in 1997. Further, no information on the sample of participating patients or health care workers was provided. No justification for the size of the sample was given. Owing to the retrospective design, some selection bias and confounding factors might have affected the results of the analysis. These issues tend to limit the internal validity of the study.

Validity of estimate of measure of benefit
No summary benefit measure was used in the analysis because a cost-consequences analysis was conducted. Please refer to the comments in the 'Validity of estimate of measure of effectiveness' field (above).

Validity of estimate of costs
The costs included were consistent with the perspective adopted in the study. The acquisition cost of a ceiling lift was estimated from a published study, while the costs associated with injury claims were derived from the database of British Columbia. The unit costs were not presented separately from the quantities of resources used, which limits the possibility of replicating the study in other settings. Statistical analyses were carried out to examine the statistical significance of differences in the costs. However, the cost estimates were specific to the study setting. The price year was not reported, which makes reflation exercises in other time periods difficult.

Other issues
The authors compared their findings with those from a published study and stated that similar results were observed. The issue of the generalisability of the study results to other settings was not addressed and sensitivity analyses were not carried out, which limits the external validity of the analysis. The authors noted that staff questionnaires were not administered during the post-intervention period. Thus, staff perceptions of the programme’s effectiveness were not documented.

Implications of the study
The study results suggested that the implementation of a ceiling lift programme generated economic benefits due to reduced compensation costs within 3 years of intervention.

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None stated.

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Other publications of related interest

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MeSH
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