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
Physical therapy (PT) and occupational therapy (OT) services for the rehabilitation of elderly nursing-home residents.

Type of intervention
Rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
Residents of a nursing home. The average age of the intervention group was 83 years (range: 62 - 97) and of the control group was 86 years (range: 63 - 101). The female to male ratio was 3.5:1 in the intervention group and 3.1:1 in the control group. The Case Mix Measure (CMM), which quantifies the 'heaviness of care' required for the patients, was 72.4 in the intervention group and 74.0 in the control group. The average length of stay was 3.4 years (range: 0.0 - 10.1) in the intervention group and 3.1 (range: 0.0 - 10.1) in the control group.

Setting
The practice setting was a nursing home. The economic study was carried out in Alberta, Canada.

Dates to which data relate
Effectiveness and resource use data were collected over the period October 1990 to October 1992. All dollar calculations were performed using 1993/94 funded hourly rates.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
Costing was undertaken retrospectively, based on treatment completers from the patient sample used in the effectiveness study.

Study sample
99 of the 100 current residents who signed informed consent were assigned, using stratified random allocation by severity of condition, to an intervention ('enhanced') group or to a control group. New admissions residents (n=29) replaced those residents who died or were discharged during the project. Replacement of new admissions resulted in a final sample size of 115 (58 enhanced and 57 control). It was assumed that this replacement was a random process. Power calculations were used, but not for the purpose of determining the sample size.
Study design
The study was a randomized, controlled program evaluation at a single centre. Stratified random allocation was used. Severity was measured by the Resident Classification System (RCS). Eight indicators were found to predict variations in nursing resource use and these 8 items determined an individual's classification category. A resident's score on each of the 8 indicators was combined using a series of decision rules which then placed the individual in 1 of 7 classification categories, which were rank ordered from low to high in terms of care requirements and resource use. Weights were assigned to each category based on the differences between the nursing resources used by residents in the 7 categories. The assessors and all staff, except OT and PT staff, were blind to treatment allocation. Patients were followed up for 2 years.

Analysis of effectiveness
The analysis of the study was based on intention to treat. The primary health outcome measures used in the analysis were Functional Independence Measure (FIM), Functional Assessment Measures (FAM), and Clinical Outcome Variables Scale (COVS) recorded at 6-month intervals over a 2-year period. The instrument used was the Resident Classification System (RCS). The groups were shown comparable in age, sex, length of stay, RCS and proportion of new admissions.

Effectiveness results
The differences in the observed means increased over time, except for FIM Cognition and FAM Mobility. Statistical significance was observed on FIM Total at 6 (p=0.03) and 12 months (p=0.05), FIM Self Care at 6 months (p=0.02) and FIM Psychosocial at 6, 12, 18 and 24 months. Statistical significance was observed on FAM Total at 6 (p=0.01) and 12 months (p=0.01), FAM Self Care at 6 months (p=0.03) and FAM Psychosocial at 6, 12, 18 and 24 months. Statistical significance was observed on the COVS scores for 6 (p=0.01) and 12 months (p=0.02). Power values were below criterion levels at all times when a p value of 0.05 was not achieved.

Clinical conclusions
Although the observed mean differences could not be statistically tested over time, the results were considered to be clinically significant. In particular, the results of the FIM and FAM total score analyses demonstrated that PT/OT delivered at the 1:50 ratio (enhanced group) was more effective at promoting, maintaining or limiting decline in functional status, compared to PT/OT provided at the 1:200 ratio (control group). The lack of significant differences at the 5% level may be due to loss of power rather than to the absence of a treatment effect.

Measure of benefits used in the economic analysis
Health benefits were not formally calculated, although the authors discussed the implications of primary health outcomes for quality of life.

Direct costs
Total costs were calculated for each group, on the basis of 30 beds. Cost and quantities were not reported separately. The cost analysis was undertaken from the perspective of the provincial health department and included direct nursing care, OT and PT care costs. All dollar calculations were performed using 1993/94 funded hourly rates. Discounting was not performed.

Statistical analysis of costs
A statistical analysis of costs was not performed.

Indirect Costs
These were not included in the analysis.
Currency
Canadian dollars (Can$).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Estimated benefits were proxied by the effectiveness estimates.

Cost results
The cost for 30 resident/beds for the period 1990 to 1992 was Can$1,614,910 for the control group and Can$1,597,937 for the enhanced group. The net cost savings over the 2 years of the study, resulting from the intervention, was Can$16,973. This represents a saving of Can$283 per bed year.

Synthesis of costs and benefits
A synthesis of costs and benefits was not performed.

Authors' conclusions
Increasing the intensity of PT and OT can have a positive effect on the functional status and cost of care of long-term care residents. Also, any effort to limit functional decline promotes resident choices, autonomy, independence, environment freedom, and thus, quality of life. It also reduces the need for caregiver involvement and care delivery costs. The results suggest that, with proper incentives, client status can be improved at reduced cost. However, before these results can be generalised to other settings, further research using larger samples is required.

CRD Commentary
Selection of comparators
A justification was given for the choice of comparator, namely that it represented the practice in local nursing homes. You, the database user, should consider the relevance of this practice to your own setting.

Validity of estimate of measure of benefit
A detailed statistical analysis of the effectiveness results was performed, but a lack of power casts uncertainty on the findings. Moreover, because of the study design and sample attrition, observed mean differences could not be statistically tested over time. A sensitivity analysis, to assess the implications of changes in the value of these differences, was not performed. A health benefit, in terms of quality of life, which could have investigated psychosocial benefits, was not formulated.

Validity of estimate of costs
Costs were not statistically analysed. Costs and quantities were not reported separately, which limits the generalisability of the findings to other settings. However, the authors emphasised that the results cannot be extrapolated until further research using larger samples is undertaken.

Other issues:
The authors' conclusion, that increasing the intensity of PT and OT results in improved outcomes and cost savings, is not supported by the evidence from the study. Although statistical analyses were performed on the effectiveness measures, the lack of power in the study means that the statistical significance of the findings is uncertain. Inadequate
reporting of costs, which were not statistically analysed, further limits the interpretability of the results.

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