Does an exercise and incontinence intervention save healthcare costs in a nursing home population?

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
The impact of functional incidental training (FIT) on incontinent, long-stay nursing home (NH) residents was studied. FIT comprised low-intensity, functionally oriented exercise and incontinence care. The programme aimed to reduce the incidence of the following conditions:
dermatological, genitourinary, gastrointestinal, respiratory, endocrine, neurological, and cardiovascular systems;
falls and pain; and
psychiatric and nutritional disturbances.

Research staff carried out the intervention 5 days a week, every two hours, between 8 am and 4 pm. The participants were prompted to toilet during every episode of care and were changed if they were wet. The participants were also encouraged to walk or, if not ambulatory, to wheel their chairs and to repeat sit-to-stand ups to 8 times using the minimum level of human assistance necessary. The programme also consisted of upper body resistance training.

Type of intervention
Patient care management.

Economic study type
Cost-effectiveness analysis

Study population
The study population comprised NH residents. The inclusion criteria specified patients with urinary incontinence and free of a catheter, who were able to follow a simple one-step instruction, and who were not on Medicare Part A reimbursements for postacute skilled care or terminal illness.

Setting
The setting was a NH. The economic study was carried out at one non-profit and three proprietary NHs in California, USA.

Dates to which data relate
The dates during which the effectiveness and resource use data were gathered were not reported. No price year was given.

Source of effectiveness data
The effectiveness data were derived from a single study.
Link between effectiveness and cost data
The costing was conducted prospectively on the same patient sample as that included in the effectiveness analysis.

Study sample
Power calculations were carried out in the preliminary phase of the study on the basis of data coming from one of the NHs considered in the study. These suggested that a 20% reduction in the selected acute conditions could be detected with the sample size that could be recruited and retained within the budgetary constraints of the trial (power of 0.8 and alpha of 0.05). From an initial group of 633 long-stay beds in the four participating NHs, 330 individuals met the inclusion criteria. Informed consent was obtained from 257 individuals, of which 190 entered the intervention phase of the study, 92 in the intervention group and 98 in the control group. The mean age was 87.3 (+/- 8) years in the intervention group and 88.6 (+/- 6.7) years in the control group. The proportions of female residents were 80% (intervention) and 90% (control), respectively. The reasons why some individuals did not give informed consent were not provided.

Study design
This was a single-blind, randomised controlled trial that was carried out in four NHs in the USA. After a 6-month baseline period, the participants were randomised to the two groups using a computer-generated list. The unit of randomisation was the NH. The patients were followed for 8 months after randomisation. Only 148 patients (74 in each group) completed the 8-month assessment. The reasons for loss to follow-up were death or prolonged illness. Trained research nurses and physicians, who were blinded to the group assignment, reviewed the patients’ records weekly and assessed the study outcomes.

Analysis of effectiveness
The analysis of effectiveness is likely to have been conducted on the basis of treatment completers only. The primary health outcome used in the analysis was the incidence of the following conditions:

- dermatological, genitourinary, gastrointestinal, respiratory, endocrine, neurological, and cardiovascular systems;
- falls and pain; and
- psychiatric and nutritional disturbances.

The study groups were comparable at baseline in terms of their demographics, co-morbidities, severity of disease, and cognitive status. The authors performed some statistical tests (negative binomial models) to account for potential confounding factors represented by subject attrition and baseline characteristics such as demographics, acute condition-related variables, type of NH and reasons for attrition.

Effectiveness results
There was no statistically significant difference between the intervention and control groups for any of the conditions considered in the analysis. This result was corroborated in the statistical tests used to check for confounding factors.

Clinical conclusions
The effectiveness analysis showed that FIT did not reduce the incidence of acute conditions associated with physical inactivity, incontinence, or impaired mobility.

Measure of benefits used in the economic analysis
There was no statistically significant difference in any of the outcome measures used in the effectiveness analysis. Thus, a cost-minimisation analysis was carried out.
Direct costs
Discounting was not applied because the costs were incurred during 8 months. The unit costs and the quantities of resources used were not presented separately. The cost categories included in the analysis were treatment and diagnostic tests. Treatment costs encompassed medications, nurse-administered treatments, rehabilitative and other therapies, and durable medical equipment. The cost of diagnostic tests encompassed laboratory tests, radiology tests, physician and specialist visits and procedures. The perspective of the health care payer was applied. The resource use data were estimated from the sample of patients included in the effectiveness study. The costs came from Medicare and Medicaid reimbursement rates, based on the assumption that Medicare would reimburse 80% of the regional Medicare Allowable Cost. The costs of medications were based on published average prices. An addition fee per prescription was considered. Prices relating to 1997 to 1998 were used.

Statistical analysis of costs
Due to the very skewed distribution of the costs, the estimated total costs in the two groups were compared using the inverse hyperbolic sine model.

Indirect Costs
The indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were not performed.

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

Cost results
At baseline, the average cost per resident per week was $30.38 in the intervention group and $36.81 in the control group. During the 8-month study period, the cost per resident per week was $24.42 in the intervention group and $38.36 in the control group. Due to the skewed distribution of the costs, the difference in the average cost per resident did not reach statistical significance.

Synthesis of costs and benefits
Not relevant.

Authors' conclusions
The functional incidental training (FIT) intervention did not reduce the incidence of acute conditions. There was no difference in cost measures between FIT and standard care.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear. The new programme was compared with the care routinely delivered to NH residents. You should decide whether it represents a valid approach in your own setting.

Validity of estimate of measure of effectiveness
The internal validity of the effectiveness analysis was high because a single-blind, prospective randomised trial was used, which was appropriate for the study question. However, only patients who completed the final assessment were included in the analysis and a substantial loss to follow-up was reported. The study sample was representative of the study population of NH residents with problems of incontinence and impaired mobility. The methods of randomisation and sample selection were reported. The study groups were comparable at baseline, but the authors performed further statistical tests to test the impact of potential confounding factors. The reasons for the loss to follow-up were reported and power calculations were performed. The effectiveness data came from several centres.

**Validity of estimate of measure of benefit**
No summary benefit measure was used because a cost-minimisation analysis was carried out.

**Validity of estimate of costs**
The authors stated the perspective adopted in the study and reported a breakdown of the categories of costs. However, the unit costs and the quantities of resources used were not presented. The source of the cost data was reported, as well as the years to which the costs referred. The authors noted that some caution is required when interpreting the results of the economic analysis because of the highly skewed distribution of the costs, which cast doubts on the reliability of the estimated costs per patient. Statistical tests were carried out to control for the problem of variations in the costs. Sensitivity analyses were not performed.

**Other issues**
The authors made some comparisons of their findings with those from other published studies. In terms of the generalisability of the study results to other settings, the authors stressed that the conclusions of the analysis should be limited to the population of NH residents considered in the study. The authors also noted that a more intensive FIT aimed at achieving an effective reduction in the incidence of health conditions would not be feasible due to the frailness of the individuals involved. Indeed, the main reason for lack of compliance was fatigue. Improvements in medical care rather than FIT programmes would be more appropriate. However, medical care of NH residents was not in the hands of FIT staff.

**Implications of the study**
The main implication of the study was that a standard FIT programme may not be effective and cost-saving in a very frail population of NH residents.

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None stated.

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