Clinical and economic outcomes of a fall-focused pharmaceutical intervention program


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 study analysed the effect of a fall-focused pharmaceutical intervention plan (FFPIP) for the prevention of patient falls among elderly patients in a large urban rehabilitation centre, as compared with no specific intervention. FFPIP involved reviewing all medications by a pharmacist, and identifying and reviewing dosage and indications, and, with the participation of the nurse and physician, implementing changes in those causing a particular adverse effect (e.g. dizziness) or clinical condition (e.g. falls).

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population included patients in a large urban rehabilitation centre where the pharmaceutical intervention was implemented. To be included in the study participants had to be aged over 65 years and have an orthopaedic, respiratory, neurological, infection, or cardiovascular diagnosis. These diagnoses were chosen because they best represent the top diagnosis related groups at the rehabilitation facility. The exclusion criteria were age under 65 years and none of the listed diagnoses.

Setting
The setting was community care. The economic study was carried out in Florida, USA.

Dates to which data relate
Effectiveness evidence and resource use were for 1999 to 2001. The price year was not reported.

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

Link between effectiveness and cost data
The costing was undertaken on the same patient sample as that used in the effectiveness study.

Study sample
The study sample included those patients in the rehabilitation centre who had a one-year stay before the intervention period (October 1 1999 - September 30 2000) and patients who had a one-year stay after the intervention was implemented (October 1 2000 - September 30 2001). Power calculations were not reported. Two hundred patients from
each one-year period were randomly selected.

Of 200 patients reviewed in the pre-intervention group, 126 (63%) were female, the mean age was 79.6 years. 128 (64%) had 6 or fewer falls, 140 (70%) had less than 5 medications, 118 (59%) were on analgesics, 134 (67%) on cardiovascular drugs, 32 (16%) received anxiolytics, 82 (41%) received sedatives, and 54 (27%) received other psychoactive medication.

Of 200 patients reviewed in the post-intervention group, 132 (66%) were female, the mean age was 78.5 years, 140 (70%) had 6 or fewer falls, 128(64%) had less than 5 medications, 126 (63%) were on analgesics, 150 (75%) on cardiovascular drugs, 32 (16%) received anxiolytics, 72 (36%) received sedatives, and 66 (33%) received other psychoactive medication.

**Study design**

This was a single-centre, retrospective, observational study that included those patients in the rehabilitation centre, and compared outcomes before and after the intervention implementation in a random group of patients whose charts were reviewed and selected for inclusion.

**Analysis of effectiveness**

The primary health outcomes used in the analysis were the patient fall rate (number of patient falls ? 1000/patient day) and the classes and number of drugs in the drug regimen. No blinding for outcome assessment was reported. Statistical tests were performed to analyse differences in demographic characteristics, those with previous falls or not, and drug classes, as well as the intervention effectiveness. There were no significant differences in demographic and clinical characteristics between the groups at baseline.

**Effectiveness results**

The number of falls reduced from 30 patients in the pre-intervention group to 16 in the post-intervention group, representing a 47% reduction, (p=0.05).

For the post-intervention group, patient falls decreased as use of medications decreased. Decreases in drug classes were as follows: cardiovascular, 10.7%; analgesics, 6.3%; psychoactive, 18.2%; and sedatives and hypnotics, 13.9%. The authors did not report whether differences were significant.

The authors reported that the intervention had a more significant effect on female patients, but these data were not presented.

**Clinical conclusions**

Implementation of an FFPIP decreased falls by 47% and decreased the use of cardiovascular drugs, analgesics, and psychoactive medications among elderly patients in a nursing home.

**Measure of benefits used in the economic analysis**

A cost-consequences analysis (CCA) was performed, and therefore no summary measure of benefit was used in the economic evaluation.

**Direct costs**

Although the authors stated that the study was analysed from a patient and payer perspective, cost categories were not reported. Quantities and costs were not reported separately. The sources of quantity and cost data were not reported. Discounting was not reported, but this was appropriate since costs were incurred over a period of less than 2 years. The price year was not reported.
Statistical analysis of costs
No statistical analysis of costs was reported.

Indirect Costs
Indirect costs were not reported.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was reported.

Estimated benefits used in the economic analysis
The reader is referred to the effectiveness results reported previously.

Cost results
Considering that the intervention could reduce the number of falls by 47%, a substantial decrease in costs could be achieved.

The saving would be $308,000 per year, or $25,667 per month.

As the rehabilitation centre had 3,317 patient days per month, the FFPIP would save $7.74 per patient per day (pppd).

Synthesis of costs and benefits
Not relevant due to the cost-consequences analysis conducted.

Authors’ conclusions
The implementation of an FFPIP among nursing home residents decreased the number of falls, decreased the use of cardiovascular drugs, analgesics, and psychoactive medications, and achieved a substantial decrease in costs.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparator used, namely it reflected standard practice in the authors’ setting before implementing FFPIP and also because improving the drug regimen of the patients likeliest to fall is probably one of the most effective means of reducing fall risk, due to the number of medications patients received. A limitation of the study could be the sample taken and sample size used in the study, raising concerns about its generalisability. You should decide if this represents a widely used intervention in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a retrospective analysis, which may be prone to bias and may limit the validity of the comparison between groups. Also, there may be concerns about sample size and power calculations, which were not reported, and this should be taken into account in considering the results. Blinding of outcome assessment, which could reduce potential bias, was not reported. However, the authors reported that statistical analyses were undertaken to take account of potential biases and confounding factors.

Validity of estimate of measure of benefit
No summary measure of benefit was derived; the reader is referred to the effectiveness section above. Please note the limitations in terms of sample size and its power to assure the results, described above.

**Validity of estimate of costs**
According to the authors, the analysis of costs was performed from the perspective of the patient and the payer. There was inadequate detail about the estimation of costs and it is difficult to tell if relevant costs have been omitted from the analysis. The cost categories were not reported in detail and their omission might have affected the authors' conclusions. The costs and quantities were not reported separately, which would not allow the analysis to be easily extrapolated to other settings. The sources of the cost data were not reported. All these factors could affect the robustness of the costs results. No statistical analysis of costs was reported. Discounting was not necessary since all costs were incurred during a two-year period. The price year was not reported, which will make any future reflation exercise difficult.

**Other issues**
The authors did not compare their findings with those from other studies. The authors did not directly address the issue of the generalisability of the results to other settings, although they stated that larger patient samples across a multisite research setting would increase the generalisability.

**Implications of the study**
In the case of the post-intervention group, the number of patient falls decreased as the use of medications decreased. Further research to confirm these results in larger samples and to better understand the relationship between pharmaceutical interventions, sex, and fall rates reduction would prove useful.

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None stated.

**Bibliographic details**

**PubMedID**
12789875

**Other publications of related interest**


**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Accidental Falls /economics /prevention & control; Aged; Cost-Benefit Analysis; Drug Utilization Review; Drug-Related Side Effects and Adverse Reactions; Female; Florida; Health Care Costs; Humans; Male; Outcome Assessment (Health Care); Program Evaluation; Rehabilitation Centers /economics; Retrospective Studies