The short-term effect of interdisciplinary medication review on function and cost in ambulatory elderly people


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 use of an interdisciplinary medication review for elders. Initially, a practising consultant pharmacist reviewed the medication regimen. The assessment protocol considered therapeutic indication, drug efficacy for the condition, dosage correctness, prescriptive directions, interactions, duplication and the duration of therapy. The pharmacist then wrote a summary recommending whether each medication should be continued or discontinued, or the dosage changed. A medication adjustment team, comprising a physician, nurse and consultant pharmacist, then met to discuss the pharmacy recommendations using the patient’s hospital chart or clinic record.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients aged 65 years or older, cognitively intact (i.e. no evidence of dementia or cognitive dysfunction in the medical record), who were taking a minimum of five prescription medications.

Setting
The setting was primary care (a health centre ambulatory clinic). The economic study was carried out in the USA.

Dates to which data relate
The participants for the study were recruited between 1 June 1993 and 30 September 1995. The price year was 1995.

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

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

Study sample
No power calculations to determine the sample size were reported and no specific sample size was planned. The patients were recruited using aggressive newspaper and radio advertising, a mass mailing to 1,000 people, and presentations to community groups. A total of 144 elderly adults met the enrolment criteria and agreed to participate. Before the baseline visit, 4 adults decided not to participate. Sixty-three patients were then randomised to the
intervention group, and 77 to the control group. Forty-one (61.5%) patients in the intervention group were females compared with 39 (50.6%) in the control group. The mean age was 73.5 (+/− 5.9) years in the intervention group and 73.9 (+/− 5.6) years in the control group.

Study design
The study was a randomised controlled trial (RCT). The randomisation process was stratified so as to maintain a balance of race, gender and age. There was no mention of the concealment of randomisation or blinding, but this may only have been possible for the outcome measurement. The patients were followed up for 6 weeks after recruitment. Seven patients were lost to follow-up, six in the intervention group and one in the control group. Thus, a total of 57 intervention patients and 76 control patients completed study protocol measurements and intervention at the baseline and 6-week follow-up visits.

Analysis of effectiveness
It would appear that the analysis of the clinical study was conducted on the basis of treatment completers only. The primary health outcomes used in the analysis were physical functioning, cognitive functioning, health status and medication usage.

Physical functioning was measured using the timed manual performance test, physical performance test, and functional reach assessment. Cognitive functioning was evaluated using two subsets from the Wechsler Adult Intelligence Scale and a modified Randt Memory Test. For affective functioning, the Centre for Epidemiological Studies Depression Scale (CES-D) and the Self Rating Anxiety Scale were used to assess depression. The Self-Rating Anxiety Scale is similar to the CES-D except that it assesses mental, physical and emotional symptoms associated with anxiety instead of depression. Health status was evaluated by completing a symptom review and the Rand 36-item Health Survey 1.0. For medication usage, a brown bag review was conducted to determine the generic and brand name, dosage indicated, prescribed frequency of ingestion, length of use, patient’s perception of purpose and efficacy, actual use of medication, and drug-related problems.

At analysis, the groups were shown to be comparable in terms of age, gender, demographic and socioeconomic factors.

Effectiveness results
No statistically significant differences in cognitive, affective, or physical functioning were observed between the groups at the 6-week follow-up.

At baseline, both the intervention and control patients were using approximately the same number of medications, 11.7 (+/− 3.65) versus 12.3 (+/− 3.49), respectively. At follow-up, the intervention patients were using 10.2 (+/− 3.71) medications and the control patients 12.2 (+/− 3.84) medications.

The number of medications dropped was statistically significant, although the authors did not report at which level.

Clinical conclusions
The results of the study showed that the patients in the intervention group decreased their medication by an average of 1.5 drugs. However, no differences in functioning were observed between the two groups.

Measure of benefits used in the economic analysis
No summary measure of benefit was derived. In effect, the study was a cost-consequences analysis.

Direct costs
The costs and the quantities were reported separately. It was unclear whose direct costs were included in the analysis since only the drug costs were included. In addition, it was unclear who paid for these medications. The 1995 Red Book
was used to price all medications at the average wholesale price and to label them as prescription or non-prescription. The total daily usage was coded and priced according to patient report or labelling. As-needed usage was priced at a minimal usage rate of one dose or dosage regimen per month for most products, and at one dose or dosage regimen for those deemed likely to be used more frequently. Discounting was not relevant since all the costs were incurred during one year. Hence it was, appropriately, not performed. The price year was 1995.

**Statistical analysis of costs**
The costs were treated stochastically. The authors conducted t-tests to test for any statistically significant differences between the two groups. However, they did not report the level of significance used.

**Indirect Costs**
The indirect costs were not included in the analysis.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was performed.

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

**Cost results**
The monthly wholesale cost of drugs taken by the intervention patients was $162.63 (+/- 90.44) per patient at baseline, and $135.72 (+/- 75.42) per patient at the 6-week follow-up. The corresponding costs for the control group were $180.88 (+/- 88.8) per patient at baseline and $174.12 (+/- 94.56) per patient at the 6-week follow-up.

Therefore, the intervention patients saved an average of $26.92 per month in wholesale medication costs, while the control patients saved $6.75 per month, (p<0.006).

The authors noted that, had all recommendations by the team been followed, the monthly wholesale cost-savings of medications would have averaged $96.36 per person.

**Synthesis of costs and benefits**
The costs and benefits were not combined.

**Authors' conclusions**
The intervention significantly reduced the medications taken and the monthly cost, but most patients were resistant to reducing their medications to the recommended level.

**CRD COMMENTARY - Selection of comparators**
In this case the intervention, a medication review to promote regimen changes in medications, was compared with the do nothing option (i.e. leaving the medication regimen as it was). The comparator can, therefore, be considered to be current practice.
**Validity of estimate of measure of effectiveness**
The basis of the analysis of effectiveness was an RCT. This was appropriate for the study question as well-conducted RCTs are the 'gold' standard design when comparing different health interventions. As the RCT was stratified to maintain a balance of race, gender and age, the two groups were shown to be comparable at analysis. The study sample was representative of the study population. Although an RCT was conducted, the outcomes were analysed for treatment completers only. However, there was no mention of the concealment of randomisation or blinding in the outcome evaluation. Six times more patients were lost to follow-up in the intervention group than in the control group, although the actual loss to follow-up was small (six in the intervention group, and one in the control group). Thus, it would appear that this would have had little impact on the authors' results. The authors undertook appropriate statistical analyses but did not explicitly report the results of these tests, they merely reported whether or not the results were significant.

**Validity of estimate of measure of benefit**
The authors did not derive a summary measure of health benefit. Therefore, the analysis was, in effect, a cost-consequences analysis.

**Validity of estimate of costs**
The authors did not explicitly report the perspective adopted in the economic analysis, and the costs of medication were the only costs considered in the analysis. Since it was unclear who paid for these medications, it is impossible to state the perspective of the study. The costs and the quantities were reported separately, which will enhance the generalisability of the authors' results. Resource use (i.e. quantity of medications) was directly obtained from the study. A statistical analysis of the quantities was performed. However, the authors did not explicitly report the results of the t-tests, and only reported that the differences between the intervention and control group were statistically significant. The prices of the medications were derived from the 1995 Red Book. The authors performed no sensitivity analysis of the prices. Discounting was unnecessary since all the costs were incurred during a very short time. The dates to which the prices related were reported, which will ease any possible inflation exercises.

**Other issues**
The authors did not make appropriate comparisons of their findings with those from other studies. The issue of generalisability to other settings was not addressed. The authors do not appear to have presented their results selectively and their conclusions reflected the scope of the analysis. The authors reported one limitation to their study in that, despite their efforts to recruit an adequate number of patients, the number of participants may have been too small to detect improvements in functioning, so the general lack of change observed may have been a ceiling effect.

**Implications of the study**
The authors reported that, although the intervention significantly reduces the medications taken and their monthly cost, most patients were resistant to reducing medications to the recommended level. The authors therefore recommended further study to understand patient resistance to reducing adverse polypharmacy and for addressing this important problem in geriatric health. The authors also recommended greater focus on the behaviour of the people prescribing the medication.

**Source of funding**
None stated.

**Bibliographic details**
Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Drug Costs; Drug Utilization Review /methods; Female; Geriatric Assessment /methods; Health Status; Humans; Male; Polypharmacy; Practice Patterns, Physicians’

AccessionNumber
22004000077

Date bibliographic record published
30/09/2004

Date abstract record published
30/09/2004