A randomised crossover trial of chemotherapy in the home: patient preferences and cost analysis

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 health intervention examined in the study was home-based chemotherapy.

Type of intervention
Palliative care (chemotherapy).

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients aged 18 years or over, requiring chemotherapy and suitable for both home-based and hospital-based chemotherapy. Further inclusion criteria were the fact that the patients had not received any chemotherapy in the preceding 12 months and that they lived in an area geographically suitable for treatment at home.

Setting
The setting was hospital and home. The economic study was carried at the Division of Hematology and Medical Oncology, Peter MacCallum Cancer Institute, Melbourne, Australia.

Dates to which data relate
Effectiveness evidence and resource use data were collected from February 1996 to March 1997. The price year was not reported.

Source of effectiveness data
A single study was used to obtain the effectiveness data.

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

Study sample
Power calculation indicated a minimum sample size of 20 patients to provide 84% power to test the null hypothesis that none of the settings was preferred versus the alternative hypothesis that at least 85% of patients preferred one of the settings. A total of 64 patients registered on the chemotherapy in the home programme from February 1996 to March 1997. 39 patients did not enter the trial because they were not eligible for the study. 25 were included in the analysis: 12 in the "hospital first" arm and 13 in the "home first" arm. Patients in the "hospital first" arm, initially received a cycle of chemotherapy at the hospital and then a cycle of chemotherapy at home, while patients in the "home first" arm
received first a cycle of chemotherapy at home and then a cycle of chemotherapy at the hospital. In the "hospital first" arm, 2 patients were excluded because they withdrew consent and 1 was stated to be unevaluable. In the "home first" arm, one patient was excluded and one was unevaluable. As a result, the overall sample consisted of 20 patients: 9 subjects (median age: 61 years, 1 male) in the "hospital first" arm and 11 subjects (median age: 59 years, 4 male) in the "home first" arm.

**Study design**

The study was a randomised crossover trial carried out in a single centre. Patients were randomised to receive first home-based or hospital-based chemotherapy (followed by a second cycle of chemotherapy at the alternative setting) through a computer-generated randomisation chart. Patients were followed until the end of both of the chemotherapy cycles. The same group of patients was used in the analysis: each patient underwent both treatments and two groups of patients were generated who differed only in terms of the first location of the treatment received (hospital or home). No blind assessment was reported.

**Analysis of effectiveness**

The basis of the analysis of the clinical study (intention to treat or treatment completers only) was not reported, but appears to have been treatment completers only. The health outcome measured in the analysis was the patient's preference for one of the two treatment settings: home or hospital. The outcome was measured through a questionnaire focussing on patients' preference for the treatment location and any difficulty or advantage of one setting relative to the other. Statistical tests aimed at comparing the two groups at baseline were not reported, although characteristics by group were shown.

**Effectiveness results**

Home was the preferred setting for the two chemotherapy cycles for 70% of patients in both groups and none of them preferred the hospital for both the treatments. All patients expressed a preference for future treatments at home, (p<0.0001). None of the patients reported difficulties with the treatment given at home, while 4 patients reported concerns with the treatment in hospital (due to transport problems and waiting times. Eighteen patients (90%) reported that there were advantages in the treatment given at home, such as convenience, avoidance of travelling to the hospital, less anxiety, not burdening their carers and family, etc. Only one patient reported that there were more advantages in the hospital-based chemotherapy, because it was good to see other people worse off. No major complications of chemotherapy were reported in the two settings.

**Clinical conclusions**

Chemotherapy performed at home was as safe, in terms of complications, as that given at hospital. However, the effectiveness analysis indicated that "patients have an overwhelming preference for home-based therapy".

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

No summary benefit measure was used in the economic analysis, therefore a cost-consequences analysis was conducted.

**Direct costs**

Discounting was not relevant, due to the short time horizon of the study. The cost/resource boundary adopted was that of the hospital. Quantities of resources used were not reported. The health service costs included in the analysis were only those for which there could have been a difference due to the location of the therapy. Overheads related to the programme at home (such as travelling time and vehicle costs) were apportioned to nursing costs on the basis of time spent with each patient. The hospital overheads were similarly apportioned on the basis of nursing times. The cost of a single meal was also included. Costs reported in patients' records and related to health, medical staff, and pharmacy were excluded. A specific software package was used to distribute the costs during one financial year on the basis of the services received by each patient. The estimation of unit costs was presumably based on actual data derived from the hospital records. The estimation of quantities was based on data from the trial and was gathered from February 1996 to
March 1997. No price year was reported.

**Statistical analysis of costs**
A statistical analysis of difference in costs was reported.

**Indirect Costs**
Indirect costs were not included.

**Currency**
Australian dollars (Aus$).

**Sensitivity analysis**
A sensitivity analysis was conducted.

**Estimated benefits used in the economic analysis**
Please refer to the effectiveness results reported earlier.

**Cost results**
The average cost of home-based chemotherapy was Aus$83 (95% CI: Aus$46 - Aus$120; p=0.0002) greater than hospital-based chemotherapy. The average cost of the first treatment was Aus$57 greater than the cost of the second (95% CI: Aus$20 - Aus$94; p=0.0044). No carryover effect was identified (total cost in first versus second period, p=0.16).

**Synthesis of costs and benefits**
No summary benefit measure was derived because of the cost-consequences approach adopted.

**Authors’ conclusions**
The authors concluded that chemotherapy conducted at home, if feasible, can be considered as a valid alternative to traditional chemotherapy given at hospital. Although home-based therapy appeared more costly than hospital-based therapy, the analysis of costs did not include travelling costs and lost time for caregivers. The inclusion of such cost items could have reduced the difference of costs between the settings, since hospital costs appeared to have been underestimated.

**CRD COMMENTARY - Selection of comparators**
The reason for the selection of the comparator was clear. Hospital-based therapy represented the conventional intervention, while home-based therapy was supposed to reflect a more recent approach to the management of patients with cancer. You, as a user of this database, should consider whether any home-based chemotherapy programme is currently used in your own setting.

**Validity of estimate of measure of effectiveness**
Selection bias will have been reduced by the fact that randomisation was conducted. In addition, since the same sample of patients underwent both the interventions, the risks of confounding variables were reduced. Power calculations were also performed to determine the adequate sample size, although the patients all preferred home chemotherapy. The study was not, of course, powered for the detection of complications, which might require longer term observation, and it was implicitly assumed that there was no difference in health outcome.
Validity of estimate of measure of benefit
No summary benefit measure was used in the economic analysis and costs and benefits were not combined. Please refer to the commentary on measure of effectiveness above.

Validity of estimate of costs
The estimation of costs appears to have been somewhat specific to the study setting. Also, no accounting for bias was made in that no sensitivity analyses were conducted thus reducing transparency. Quantities of resources used and unit costs were not reported. Only the differential in cost between the interventions was reported. Some cost items were not included in the analysis because it was assumed that these costs were identical in both settings. The price year was not clearly specified.

Other issues
The issue of the generalisability of the study findings to other settings was not addressed and sensitivity analyses were not conducted. The authors did not compare their results with those from other studies. Overall, the external validity of the study was somewhat limited. Although effectiveness results were fully reported, those for costs were lacking. The authors’ conclusions also assumed no difference by underlying disease or type of chemotherapy.

Implications of the study
The authors pointed out that home-based chemotherapy was not likely to reduce hospital costs, but that health authorities will have to balance the overwhelming patient preferences for home-based therapy with the increase in costs. These conclusions should be viewed with the caveats described above, particularly in terms of lack of cost results and health outcomes data.

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