Case management model or case manager type: that is the question

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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
Three types of case manager were compared. More specifically, regular care, nurse case manager (NCM), and social worker case manager (SWCM). In each type of care, the care plan was developed by a patient care team consisting of the case manager, the physician advisor, and the patient's own personal physician. The author described this form of care as a consolidated model with a strong emphasis on patient advocacy. The consolidated model was defined as a "combination of interrogative and patient advocacy models where the decision-making process might be thought of as consensus building among providers that compose a team". Patient advocacy was defined as "coordination of services on the continuum of care from the client perspective".

Type of intervention
Other: Mode of care delivery.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised individuals who were aged 75 years or older and had severe functional disability, or excessive hospital or ED usage.

Setting
The setting was unclear, but it appears to have been either secondary or tertiary care. The study was conducted in the USA.

Dates to which data relate
The dates when the effectiveness and resource use data were gathered were not reported. A price year was also not reported, although some costs were collected from 1992.

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

Link between effectiveness and cost data
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness study.

Study sample
The author did not report from where the sample was drawn, or exactly how the 317 enrolees were selected. It was not reported whether power calculations, to estimate the impact of chance on the results, were carried out. The sample was
appropriate for the clinical question since it included patients who were likely to require direct care in the near future. Of the 317 individuals enrolled, 70 received nurse-led care (mean age 81.56 years), 70 received social worker-led care (mean age 80.76 years), and 177 received routine care (mean age 82.4 years). The mean ages of the groups were 81.56 years (nurse-led care), 80.76 years (social worker-led care) and 82.4 years (routine care), respectively. The author did not report any specific exclusions or patients refusing to participate.

**Study design**
The basis of the analysis was a randomised controlled trial. Details of the method and unit of randomisation were not reported. The study seems to have been based at a single centre, although this was not explicitly reported and details were not given. The participants were followed for 2 years and no loss to follow-up was reported. Blinding would not have been possible due to the nature of the study.

**Analysis of effectiveness**
The authors did not report whether the analysis was conducted on an intention to treat basis or on treatment completers only. The primary health outcomes were:

- mean hospital admissions,
- mean hospital days,
- mean outpatient visits, and
- mean emergency department visits (dependent variables), and

their correlation to case management (independent variable).

The author used bivariate difference of proportions (chi-squared) and difference of means (one-way analysis of variance) to compare the three populations. The only variables found to be statistically significant between the groups were living status, E-path (how the patients entered the study) and age. The author discussed the implications of these differences on the results.

**Effectiveness results**
The mean hospital visits were 1.81 for the registered nurse case manager (RNCM) group, 1.9 for the SWCM group, and 0.166 for the RCM group, (F-statistic 0.303, significance 0.739).

The mean total hospital days were 13.63 for the RNCM group, 14.07 for the SWCM group, and 12.93 for the RCM group, (F-statistic 0.067, significance 0.935).

The mean outpatient visits were 45.75 for the RNCM group, 45.16 for the SWCM group, and 41.32 for the RCM group, (F-statistic 0.925, significance 0.397).

The mean ED visits were 5.28 for the RNCM group, 4.81 for the SWCM group, and 5.31 for the RCM group, (F-statistic 0.259, significance 0.772).

The death rates were 0.2319 for the RNCM group, 0.2727 for the SWCM group, and 0.3007 for the RCM group, (F-statistic 0.550, significance 0.577).

The mean days of exposure were 661 for the RNCM group, 651 for the SWCM group, and 550 for the RCM group, (F-statistic 6.892, significance 0.001).

Significant variables from the logistic regression included quasi-objective health status, gender, mode of entering the study, and activities of daily living.
Clinical conclusions
The author concluded that the results "pointed out the need to carefully evaluate the various models of case management". The author did not draw any conclusions about which type of case management was preferable.

Measure of benefits used in the economic analysis
The author measured the extent to which patients needed help with activities of daily living, self-assessed health status and the quasi-objective health status, measuring the number of diseases and conditions faced by the patient. The patients rated the self-assessed health status and the quasi-objective health status themselves. These measures were not combined with the cost estimates.

Direct costs
The author did not report a perspective for the cost analysis. The cost estimates focused on service costs and programme costs. The service costs included hospital admissions, hospital days, outpatient visits and ED visits. These were estimated through the organisations internal information system in 1992. The programme costs were identified as the salaries and fringe benefits of the two case managers and a research assistant. Programme costs were referred to as direct costs, while service costs were referred to as indirect costs. Discounting was not reported despite the 2-year horizon of the study. The costs were estimated from actual data.

Statistical analysis of costs
Bivariate difference of means (analysis of variance) was used to compare service use, costs and days of exposure.

Indirect Costs
The author did not estimate the indirect costs. This was appropriate as the average age of the patients was beyond a standard working age. Therefore, treatment will not have had implications for economic productivity.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analyses were reported.

Estimated benefits used in the economic analysis
The author did not report the actual benefits. Instead, he reported the results of the logistic regression, focusing on the relationship between measures of health benefit and dead or alive status, reporting statistics as an odds ratio (OR) of dying.

Self-assessed health had ORs of 1.2721 (95% confidence interval, CI: 0.37 - 4.36), 1.7264 (95% CI: 0.52 - 5.68) and 3.1316 (95% CI: 0.87 - 11.23). These may represent the ratios between good, fair and poor health to excellent, but the meaning behind the results is not at all apparent and this interpretation may be misconstrued.

The OR for quasi-objective health status was 1.1680 (95% CI: 1.02 - 1.34; p<0.1).

The OR for activities of daily living was 1.1906 (95% CI: 1.04 - 1.35; p<0.001).

The OR for independent activities of daily living was 0.9654 (95% CI: 0.71 - 1.31).

The author did not discuss these results well.
Cost results
The total service cost per person was $17,194 for the RNCM group, $17,295 for the SWCM group, and $15,417 for the RCM group, (F-statistic 2.435, significance 0.089).

The total hospital service cost per person was $9,099 for the RNCM group, $9,269 for the SWCM group, and $6,826 for the RCM group, (F-statistic 1.970, significance 0.141).

The total service costs for the study period were $2,414,043 for case-managed care and $2,473,221 for regular care.

The total programme costs were $135,314 for case-managed care.

The total costs for the study period were $2,549,357 for case-managed care and $2,473,221 for regular care.

The average total costs per person were $18,210 for case-managed care and $13,973 for regular care.

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

Authors' conclusions
The author did not make any summary statements about which type of case management was preferable on either cost or effectiveness grounds. However, he stated that the results demonstrated the need to evaluate models of care management.

CRD COMMENTARY - Selection of comparators
The author compared SWCM and RNMC groups. The reasons for choosing these comparators were not at all clear, as the author spent much of the early paper discussing types of care management rather than manager, focusing on interrogative case management and the patient advocacy model. It was unclear why the author did not assess other forms of case management, such as those led by consultants. Usual care in the author's setting was not reported.

Validity of estimate of measure of effectiveness
The basis of the analysis was a randomised controlled trial. This is a good design for minimising systematic differences between groups and thereby reducing the potential for bias in the results. The study sample determined the study population, as the author does not appear to have predefined the population of interest. The patient groups were compared using many demographic and health status factors. The groups were found to differ significantly by living status, E-path and age. Appropriate statistical analyses were undertaken to compare the outcomes between the three groups.

Validity of estimate of measure of benefit
The benefits were estimated from the effectiveness analysis. Measures of help with activities of daily living, self-assessed health status and quasi-objective health status were assessed. The author argued that attempts to measure the quality of additional days of life would require unacceptable intrusion. However, with generic quality of life scales (e.g. Euroquol) already in place, some attempt at measuring quality could be made relatively easily.

Validity of estimate of costs
The author did not report the perspective from which the costing was carried out. Therefore, it is not possible to assess whether all the relevant costs were incorporated. The analysis focused on service costs and programme costs, and would seem to represent the perspective of the hospital or third-party payer. Given the substantial difference in total costs per person between the groups, small omissions in cost or small changes, owing to changes in the perspective, are unlikely to affect the principal results.
Other issues
The author did not compare the results to findings from other studies. It was unclear whether this was because no similar study had been carried out, although this seems unlikely. The issue of generalisability was addressed with the author acknowledging that, with the use of a single case management intervention in one setting and with a unique population, the results "cannot be generalised to any other population". However, it seems as though other authors and policy makers concerned with the effectiveness of nurse- and social worker-led care in the elderly might look to this study for some idea of expected costs and effects. The results do not appear to have been presented selectively, although a more explanatory discussion of the meaning of the results would have been useful. The author did not really draw conclusions about the costs and effects of this technology, focusing instead on stating the need for further research in this area. Limitations included the lack of generalisability and the inability to measure quality of life.

Implications of the study
The author did not make any recommendations for policy or practice following the study, although he did stress that further work in this area is needed.

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