

# Five year follow up of a randomised controlled trial of a stroke rehabilitation unit

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Caring for stroke patients in stroke units, compared with other hospital locations, leads to decreased mortality and disability at one year.<sup>1</sup> A trial of a combined acute and rehabilitation ward in Trondheim, Norway, showed that hospital care improved survival and functional outcome at five years.<sup>2</sup> The benefits were attributed to the treatment provided in the first few weeks after stroke. The purpose of this study was to examine the effects of care in a non-acute stroke unit on outcome at five years.

## Methods and results

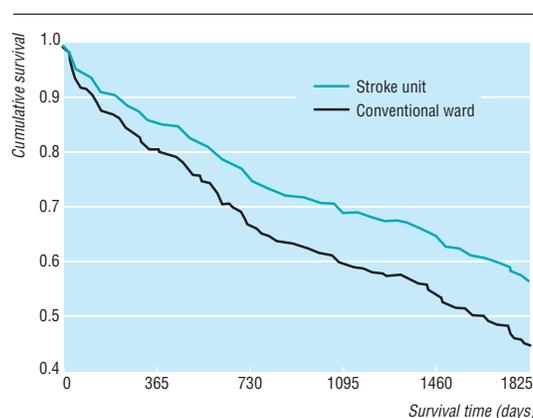
The methods and findings of 315 patients at one year of our randomised study comparing a non-acute stroke rehabilitation unit with care on conventional medical and geriatric wards have been published.<sup>3</sup> In the present study, we ascertained survival to five years by using hospital records and death certificates. Survivors were traced to establish their residential status and visited by a researcher who was blind to group allocation. Subjects were assessed by using all the assessments made earlier,<sup>3</sup> including the Barthel scale.<sup>4</sup> Relative risks were calculated for death, death and dependency (using a Barthel score of  $\leq 18$  to denote dependency), and death and institutionalisation, an institution being defined as a nursing home, residential home, or hospital. Survival curves were generated using the Kaplan-Meier method and compared by using the log rank test.

Altogether 176 patients were randomly allocated to the stroke unit and 139 to conventional wards. The groups were similar at baseline. At five years, 79 (45%) patients in the stroke unit and 77 (55%) in conventional wards had died, 60 (34%) patients in the stroke unit and 37 (27%) in conventional wards were disabled (Barthel  $\leq 18$ ), and 21 (12%) patients in the stroke unit and 11 (8%) in conventional wards were in institutional care. The relative risks of death (0.81, 95% confidence interval 0.65 to 1.01), death or disability (0.91, 0.83 to 0.99), and death or institutional care (0.90, 0.75 to 1.08) were all in the direction of more favourable outcome for patients in the stroke unit. Figure 1 shows the survival curves, which differed significantly (log rank test: 4.36,  $P = 0.04$ ).

Of the 159 patients alive at five years, 139 (90 in the stroke unit) were assessed, and 20 patients (7 in the stroke unit) withdrew from the study. Baseline characteristics of the survivors did not differ between groups, nor did any of the outcomes in terms of personal and instrumental activities of daily living, mood, adjustment, strain on the carer, or mood of the carer (Mann-Whitney U tests  $P > 0.05$ ).

## Comments

The long term advantage of stroke units over ordinary care is largely the result of improved survival. Our study was not powered to detect a survival difference,



Survival times of patients in stroke unit and in conventional ward (both in Nottingham)

and so our observed survival advantage is imprecise but is similar to that seen in the Trondheim study.<sup>2</sup> If this estimate were to be confirmed by more studies it would be important for public health.

Mortality differed even though patients in this study were randomised an average of two weeks after their stroke. Our trial does not explain the observed benefits, and we did not monitor medical aftercare. We speculate that improved longer term survival in the stroke unit group is a consequence of the shorter term benefits of the earlier reduction in disability. Differential mortality according to level of disability might also explain why the functional benefit of the stroke unit that was seen up to one year was not seen at five years.

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