**Stroke unit care decreased mortality and increased the number of patients who were living at home 10 years after stroke**


**QUESTION:** For patients in hospital with acute stroke, does care in a stroke unit (SU) decrease long term mortality and increase independence and the proportion of patients who are living at home when compared with general ward (GW) care?

**Design**
Randomised (allocation concealed), blinded (outcome assessor), controlled trial with 10 years of follow up.

**Setting**
A university hospital in Norway.

**Patients**
220 patients (mean age 73 y, 51% men) in hospital with acute stroke. Exclusion criteria were deep coma on admission or living in a nursing home before onset of symptoms. Follow up was 100%.

**Intervention**
110 patients were allocated to care in a 6 bed SU. The programme was standardised with up to 42 days (mean 16 d) of team based care that included diagnostic evaluation, acute treatment, and mobilisation and rehabilitation from nurses, physicians, and other therapists, with an emphasis on family and patient participation. Functional training and motor relearning were emphasised. 110 patients were allocated to GW care with rehabilitation. After 6 weeks, patients received care from their family physicians.

**Main outcome measures**
Mortality, functional independence (Barthel index), and living at home or in an institution.

**Main results**
14 patients did not receive their allocated treatment but were included in the intention to treat analysis. Patients in the SU group had a lower rate of mortality in the first 6 weeks (p = 0.03) and this difference was still seen at 10 years (p = 0.008) (table); groups did not differ for mortality at 6 weeks to 1 year, 1–5 years, and 5–10 years. Patients in the SU group were also more likely to be independent or partly independent (p = 0.01) and living at home (p = 0.02) than were patients in the GW care group (table). The groups did not differ for proportion of patients living in institutions at 10 years (5.4% v 4.5%, p = 0.75).

**Conclusion**
After 10 years, stroke unit care for hospital patients decreased mortality, increased being independent or partly independent, and increased the proportion of patients living at home when compared with usual ward care.

**COMMENTARY**

The well designed study by Indredavik et al examines 3 clinically important outcomes 10 years after stroke, a much longer follow up period than most other SU trials. It shows that timely acute hospital treatment of stroke plus early mobilisation, interdisciplinary teamwork, and patient and family participation improve long term outcomes. The authors found a difference in mortality between SU and GW patients 6 weeks and 10 years after stroke. Through neurological stabilisation, treatment of underlying health problems, and very early mobilisation, the SU intervention likely limited the iatrogenic effects of illness, immobility, and hospital admission. The continued difference in mortality between the groups from 6 weeks to 10 years is probably because of the combined acute medical treatment and early rehabilitation. It should be noted that not all studies of acutely ill older adults have shown long term benefits.

Although the study participants were from Norway, there is some generalisability to populations in other countries with similar sociodemographic and clinical characteristics. Given the exclusion criteria, however, the findings might not apply to some patients who present with the most severe strokes. In discussing the differences in mortality between the groups at 6 weeks, the authors did not describe prognostic variables that affect stroke outcomes. For example, dysphagia, with suboptimal nutritional status, is a prognostic factor for decreased longevity. Long term tube feeding is usually associated with severe strokes, poses high risk of secondary complications, and therefore influences mortality. Overall, the high 10 year all cause mortality rates may be a reflection of old age; the mean age at inclusion in the trial was 73 years.

The study adds to the growing literature showing that a specialised SU, a standardised acute care and rehabilitation treatment protocol, and interdisciplinary team work reduce mortality and improve outcomes in older adults with acute stroke. These findings are a valuable contribution to the development of SUs and standards of care. As indicated by the authors, further studies that directly compare different types of SUs will advance our understanding of the effectiveness of various models.

Maureen Shaw, RN, MN
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**Stroke unit care v general ward care for patients with acute stroke**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Stroke unit</th>
<th>Ward care</th>
<th>RRR (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality at 6 wk</td>
<td>7%</td>
<td>17%</td>
<td>58% (10 to 81)</td>
<td>10 (5 to 73)</td>
</tr>
<tr>
<td>Mortality at 10 y</td>
<td>76%</td>
<td>87%</td>
<td>14% (2 to 25)</td>
<td>8 (5 to 65)</td>
</tr>
</tbody>
</table>

**RBI (CI)**

| Independent or partly independent at 10 y | 20%      | 8%       | 144% (21 to 402) | 8 (5 to 37) |
| Living at home at 10 y | 19%      | 8%       | 133% (14 to 382) | 9 (5 to 53) |

*Abbreviations defined in glossary; RRR, RBI, NNT, and CI calculated from data in article.*