Review: Stroke units reduce death, dependency, and institutionalized care


Objective
To determine the effectiveness of organized stroke units (SUs) in reducing death, dependency, and need for institutionalization compared with general medical ward (GMW) care in patients hospitalized with acute stroke.

Data sources
Studies were identified using MEDLINE; Index Medicus; Current Contents; Dissertation Abstracts; hand searches of 22 core journals; bibliographies of review articles, studies, and textbooks; lists of conference abstracts; and contact with colleagues.

Study selection
Randomized controlled trials that studied dedicated SUs, mixed assessment and rehabilitation units, or GMW (usual) care and had outcomes of death, dependency, or need for long-term institutionalization were selected. Dependency was defined as the need for physical assistance with transfers, mobility, feeding, dressing, or toileting. Institutionalization included nursing home placement, residential care placement, or hospitalization at the end of the rehabilitation period.

Data extraction
Data were collected from investigators on trial design; details of the service units; patient characteristics, including details of stroke severity (mild, moderate, or severe); and outcomes of death, dependency, and institutionalization.

Main results
19 trials (21 comparisons) included 3249 patients. At the end of the trials, the mortality rate in the SU group was lower than that of the GMW group (21% vs 25%; weighted relative risk reduction 14%, 95% CI 0% to 26%, P = 0.043). The corresponding rates were 37% and 38% for dependency and 19% and 22% for institutionalization. Analyses of the combined end points of death and dependency and combined death and the need for institutionalization favored SUs over and that GMWs (P < 0.001 for both comparisons) (Table). Results were similar when the data from mixed and rehabilitation wards were included.

Conclusion
Specialized stroke units reduce death, dependency, and the need for long-term institutionalization compared with general medical ward care in patients hospitalized with stroke.

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Stroke units vs general medical ward care

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Stroke unit weighted EER</th>
<th>Ward care weighted CER</th>
<th>RRR (95% CI)</th>
<th>Weighted ARR</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death and dependency</td>
<td>61.1%</td>
<td>67.9%</td>
<td>9%</td>
<td>6.8%</td>
<td>15</td>
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<tr>
<td></td>
<td>(16 to 39)</td>
<td>(9 to 71)</td>
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<td>(12 to 41)</td>
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<tr>
<td>Death and institutionalization</td>
<td>37.7%</td>
<td>47.5%</td>
<td>18%</td>
<td>9.8%</td>
<td>11</td>
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<td>(6 to 28)</td>
<td>(7 to 32)</td>
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*Abbreviations defined in Glossary; RRR, ARR, NNT, CI calculated from data in article.

Commentary
The review by the Stroke Unit Trialists’ Collaboration confirms and extends the results of the landmark meta-analysis of Langhorne and colleagues (1). The meta-analysis was the first to draw attention to the surprising benefits of organized SU care on survival and functional independence compared with routine GMW care for patients with stroke. Several new trials have been added to this review, and the results have been separated according to the service modality being compared. The advantages of SU over GMW care are still impressive: About 1 patient in 11 will be prevented from dying or needing long-term institutional care if treated in an organized SU rather than a GMW. In absolute terms, this benefit is more than twice that expected from thrombolytic treatment for myocardial infarction.

The advantages of SU care are at least as great in older as in younger patients and in those who have had severe strokes as in those who have had milder strokes.

Unlike the original report, this collaborative review directly involved investigators from nearly all the trials to try to determine why SU care was superior. They found little evidence of differences in staff numbers or mix or in the intensity of rehabilitation provided in “organized” and “conventional” care settings, although a tendency was shown for assessment and therapy to begin earlier in organized settings. The most striking differences were the degree of specialized medical and nursing interest in stroke, staff training, interdisciplinary coordination, and the involvement of family and caregivers in the rehabilitation process.

Because the implementation costs are relatively small, every hospital should now organize its stroke service according to these principles.

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Reference