

Dr Foster's case notes

Acute stroke units and early CT scans are linked to lower in-hospital mortality rates

Stroke is the third largest cause of death in the United Kingdom and other developed countries. Early diagnosis, including a brain scan, and treatment in a specialist hospital based stroke unit have been shown to be effective in improving outcomes. The NHS in England has recently introduced the target that all hospitals should ensure stroke patients are given a CT scan within 48 hours of admission and are treated in a specialist stroke unit. The minority of hospitals that do this are achieving significantly better in-hospital death rates.

The bottom line

- Hospitals with an acute stroke unit were associated with an 11% lower odds of death in hospital
- Hospitals that had rehabilitation stroke units or combined acute and rehabilitation units showed no significant difference in the odds of death
- Hospitals that performed CT scans within 48 hours on all suspected stroke patients were associated with an 8% lower odds of death in hospital

The value of specialist stroke units and early scans for stroke patients is recognised in the United Kingdom and many other countries. However, most stroke patients treated by the NHS do not currently receive this level of care. There is evidence that this is leading to unnecessarily high death rates.

Dr Foster collected data on hospital treatment of stroke patients from 132 out of 172 NHS acute trusts across England in 2001, including information on whether or not hospitals had stroke units, the type of stroke unit, and whether or not the hospital ensured early CT scans for all stroke patients. We calculated odds ratios of deaths, adjusted for age, sex, and length of stay, for individual NHS trusts. Hospitals with acute stroke units and those that scanned patients within 48 hours showed significant improvement. Units that scanned patients within 24 hours did not show improvement, but there were relatively few of these (n = 39).

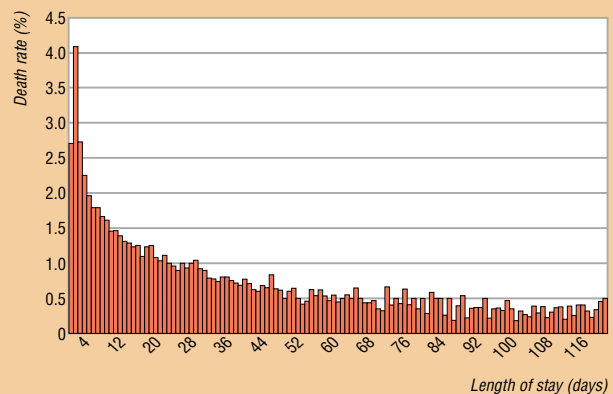
Odds ratios for stroke death (adjusted by age, sex, and length of stay) for emergency admissions for hospital trusts with acute stroke units, compared with not having a unit

| Characteristic | Odds ratio (95% CI) |
|-------------------------|---------------------|
| Acute unit | 0.89 (0.85 to 0.93) |
| Rehabilitation unit | 1.03 (0.99 to 1.07) |
| Combined unit | 0.99 (0.95 to 1.03) |
| CT scan within 48 hours | 0.92 (0.88 to 0.96) |
| CT scan within 24 hours | 1.00 (0.96 to 1.05) |

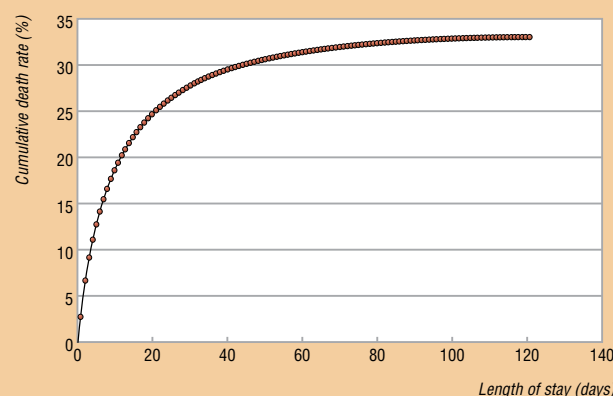
Basic figures

- 10% of people admitted with a primary diagnosis of stroke will die within two days
- The 30 day in-hospital death rate is 29%, and the total in-hospital death rate is 34%
- Crude in-hospital death rate by unit ranged from 10.8% to 48.9%

In-hospital death rate after emergency admission for stroke, England, 2001



Cumulative in-hospital death rate after emergency admission for stroke, England, 2001



Dr Foster's Case Notes are compiled by Prof Brian Jarman, Dr Paul Aylin and Dr Alex Bottle of the Dr Foster Unit at Imperial College. Dr Foster is an independent research and publishing organisation created to examine measures of clinical performance.



Full methodological details are available on bmj.com and drfoster.com

