In-Hospital Care Pathways for Stroke: A Cochrane Systematic Review

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Background
Care of stroke patients varies significantly between hospitals. Implementation of a stroke care pathway may be a method of promoting organized and efficient patient care that is based on the best-available evidence and clinical guidelines. This, in turn, could reduce variations in stroke care.

A care pathway can be defined as a plan of care that is developed and used by a multidisciplinary team, and is applicable to more than 1 aspect of care. It can be a printed document or an electronic program, and it usually forms all or part of the patient’s case record. Care pathways are often used in conjunction with other tools such as case management, and they are intended to assist healthcare professionals in clinical decision-making. Care pathways are also known by other names such as clinical pathway, critical pathway, critical path method, care paths, and CareMaps. Despite the popularity of care pathways, the evidence to support their use is weak. This systematic review aims to assess the effects of care pathways, as compared with standard medical care, among patients admitted to hospital with acute stroke.

Methods
We searched the Cochrane Stroke Group Specialized Trials Register (last searched in May 2001), the Cochrane Controlled Trials Register (Issue 4, 2000), MEDLINE (1975 to 2000), EMBASE (1980 to 2000), CINAHL (1982 to 2000), the Index to Scientific and Technical Proceedings (ISTP, May 2001), and HealthSTAR (May 2001). We also handsearched the Journal of Managed Care (1997 to 1998), which was later renamed the Journal of Integrated Care (1998 to 2001). The reference lists of the retrieved articles were also searched.

We considered randomized controlled trials and nonrandomized studies (quasi-randomized trials, comparative studies, before and after studies, and interrupted time series) that compared care pathway care with standard medical care. One reviewer selected the studies for inclusion and the other independently checked the decisions. Two reviewers independently assessed the methodological quality of the studies. One reviewer then extracted the data and the other checked the extracted data. We found significant statistical heterogeneity in the analysis of 2 of the 24 outcomes studied (computed tomography [CT] brain scanning, length of stay).

Results
We included 3 randomized controlled trials (total of 340 patients) and 7 nonrandomized studies (total of 1673 patients). We found no significant difference between care pathway and control groups in terms of death, dependency, or discharge destination. Evidence from mainly nonrandomized studies suggests that stroke patients managed using a care pathway may be (a) less likely to suffer a urinary tract infection (OR 0.38, CI 0.18 to 0.79); (b) less likely to be readmitted to hospital (OR 0.11, CI 0.03 to 0.39); and (c) more likely to have a CT brain scan (OR 3.66, CI 1.45 to 9.27) or carotid duplex study (OR 2.45, CI 1.3 to 4.61). Evidence from randomized trials suggests that patient satisfaction and quality of life may be significantly lower in the care pathway group (%0.02 and P<0.005 respectively). There was no significant difference in the length of stay between the 2 groups.

Discussion
The results of this review should be interpreted with caution because nonrandomized studies, which are highly susceptible to bias, have been included. Sources of biases include selection of patients; retrospective data collection; inclusion of nonconsecutive cases; lack of blinding of the investigators who assessed the outcomes; tendency for investigators to report only positive results; and publication bias. Factors that limited the reliability of the results of this review include variations in the definition and components of the intervention; the small number of studies included in data analysis; and presence of significant heterogeneity between the studies.
Data, chiefly from nonrandomized studies, provided weak evidence that care pathways may improve the process of care, hence leading to fewer complications (urinary tract infections and hospital readmissions) and more thorough investigations (more CT brain scans and carotid duplex studies). However, care pathway care may be associated with lower patient satisfaction and quality of life. The reasons for these adverse effects are unclear, but if the aim of the care pathways in these studies was to shorten the length of stay in hospital, then there may be pressure on the staff to discharge the patients as soon as possible, which could be before they were ready for discharge.

In this review, 4 studies reported a reduction in the mean hospital cost, and 1 study found no significant difference in cost. Only 1 study reported the items of costs and their individual values. Without knowing the cost of the individual items for these 5 studies, it was impossible to perform quantitative meta-analysis of the cost data.

In this brief summary, it is not possible to give the full details of the analyses on the 24 outcomes studied, or to include any graphs. Full details and all the graphical plots are available in the version of this review published in the Cochrane Library. Many hospital and university libraries now provide free online access to the Cochrane Library; subscription details are available at http://www.update-software.com/Cochrane/and reprints of the full article can be obtained from the Update Software document delivery service (http://www.updateusa.com/document_delivery/Doc-delivery.html).

**Implications for Practice**

The use of care pathways to manage stroke patients in hospital may be associated with both positive and negative effects on the process of care and clinical outcomes. Since most of the results have been derived from nonrandomized studies, they are likely to be influenced by potential biases and confounding factors. There is currently insufficient supporting evidence to justify routine implementation of care pathways for acute stroke management or stroke rehabilitation in hospital.

**Implications for Research**

Further research is necessary before widespread implementation of stroke care pathways is recommended. In particular, well-conducted randomized and nonrandomized studies should be undertaken. More information is needed on the effects of care pathways on functional outcomes; process of care; quality of life; patient and carer satisfaction; implementation of evidence-based practice; and hospital cost. Qualitative research may also provide information on the best method of design, implementation, and evaluation of care pathways.

**References**

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