How has the impact of 'care pathway technologies' on service integration in stroke care been measured and what is the strength of the evidence to support their effectiveness in this respect?

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CRD summary
This review evaluated the use of integrated care pathways on service integration in stroke care. The authors concluded that although the studies were methodologically weak, some elements of service integration and clinical outcomes were improved with integrated care pathways. This review had some methodological limitations, however, the broad conclusion reflects the evidence.

Authors' objectives
To evaluate the impact of integrated care pathways on service integration and its derivatives in stroke care.

Searching
MEDLINE, CINAHL, EMBASE, ASSIA, BNI (British Nursing Index), PsycINFO, National Research Register, The Cochrane Library (Cochrane Database of Systematic Reviews, DARE, Cochrane Central Register of Controlled Trials, CMR, NHS EED, HTA, Joanna Briggs Institute Systematic Review Database, SIGLE, Zetoc, Web of Knowledge, National Institute for Clinical Excellence and Dissertation Abstracts were searched for studies conducted between 1980 and 2006; search terms were reported. Additional studies were sought by manually checking the reference lists of retrieved articles and key journals. Unpublished data from conference papers, research reports and dissertations were also sought. Experts were contacted. Only studies published in English or available in translation were included.

Study selection
Studies of adult patients with all types of stroke were eligible for inclusion.

Studies had to meet the definition of integrated care pathways as developed by the European Pathway Association. Studies that evaluated integrated care pathways across the spectrum of stroke care, including acute care, rehabilitation and long-term support in the hospital and community settings were eligible for inclusion. Studies that solely focused on a single aspect of stroke care or that evaluated integrated care pathways as part of a wider programme of service development were excluded. In the included studies, integrated care pathways were locally generated and had been implemented from between three months and two years before evaluation.

Studies were required to make an explicit link between a care pathway technology and service integration. Studies that focused on outcomes of variance analysis were excluded. In the included studies, service integration was limited to inter-professional and intra-organisational integration. They used a range of system, patient and process outcome measures including communication, role clarity, documentation, role planning, flexibility, care costs, length of stay and clinical and therapeutic interventions.

Randomised controlled trials (RCTs) and quasi-experimental, qualitative and health economics research were eligible for inclusion.

It appeared that more than one reviewer performed the study selection.

Assessment of study quality
The methodological quality of the included studies was assessed using the following criteria: method of sampling; clear inclusion criteria; adequate sample size; allocation concealment; blinding; comparability between treatment and control groups; congruity between research methodology and research question; and appropriate analysis. The authors did not state how many reviewers performed the validity assessment.

Data extraction
A data extraction tool was developed for all study types. The authors did not state how many reviewers performed the data extraction.

**Methods of synthesis**
The studies were combined in a narrative synthesis.

**Results of the review**
Five studies were included in the review: one RCT; three before-and-after studies; and one case study. The number of participants was not reported.

The included studies appeared to have been methodologically weak.

The RCT found no significant differences in total length of hospital stay, rehabilitation therapy, anxiety or mortality between the integrated care pathway group and those who received conventional multidisciplinary team care. Patients who received multidisciplinary team care improved significantly faster between four and 12 weeks ($p<0.01$); there was no significant difference in recovery at 26 weeks. A significantly greater proportion of patients in the integrated care pathway group were screened for visual or sensory inattention ($p=0.015$) and nutritional assessment ($p=0.001$); there were no significant differences in a number of other outcomes relating to care and patient measures. Overall, integrated care pathway-led stroke management was associated with a poorer quality of life than that achieved by multidisciplinary team care (various measures to assess quality of life were reported).

One before-and-after study found inconsistent evidence in total length of stay between the integrated care pathway intervention and control groups. This study also reported that the number of urinary tract infections was significantly reduced ($p<0.05$) in the integrated care pathway intervention group compared to controls, and that the introduction of the integrated care pathways reduced contractual losses to the hospital. Other outcomes were non-significant.

Another before-and-after study reported that the proportion of patients receiving a brain CT scan within 24 hours of stroke was significantly increased in integrated care pathway-managed patients ($p=0.0017$). There were also significant increases in the provision of investigations to establish the aetiology of cerebral infarct ($p<0.05$) and the use of prophylactic measures to prevent deep venous thrombosis ($p=0.0026$). There was no significant difference in the number of patients receiving preventative drug therapy at discharge. Average length of stay was reduced in integrated care pathway-managed patients, but the difference was not significant.

The third before-and-after study found that patients in the integrated care pathway group were more likely to receive a CT brain scan within 24 hours and 48 hours ($p=0.02$ for both) than patients in the control group. There were no significant differences for carotid duplex scan, echocardiography, cerebral angiography, use of medications or the provision of other types of therapy (dietician assessment, occupational therapy, speech and language therapy) or nursing interventions. There was also no difference in the length of stay between groups. A number of patient outcomes were also measured; there were fewer UTIs in the integrated care pathway group ($p=0.03$).

The case study reported how an integrated care pathway may be utilised effectively.

**Authors' conclusions**
The authors' conclusion appeared to be that despite methodological weaknesses of the included studies there was some evidence that integrated care pathways may support certain elements of service integration and clinical outcomes for stroke care.

**CRD commentary**
The review question and inclusion/exclusion criteria were clearly defined. The search was well conducted, although restricting the included studies to those published in English (or those with an English-language translation) may have resulted in omission of some relevant data. The authors conducted a thorough assessment of quality, but specific details of this assessment were not reported in the paper (a very general overview was presented). The authors did not state specifically how many reviewers were involved in the review process, thus potentially introducing reviewer error and bias, although it appeared that more than one reviewer was involved. Some details of the included studies were lacking. Some aspects of the review process were well-conducted, but the data were not always presented in a clear and concise manner.
manner. Given the apparent poor quality of the included studies, the information gleaned from the studies may be overstated. Overall, a broad interpretation of the authors' conclusion followed the results.

Implications of the review for practice and research
Practice: The authors stated that service providers in stroke care should restrict integrated care pathway use to those areas of the care pathway that can be standardised and predictable and/or be applied where there are identified deficiencies in existing care provision.

Research: The authors stated that more primary research was needed to identify which aspects of integrated care pathways were effective in what settings. Studies needed to have clearly defined objectives, be based on theory and have clearly defined outcome measures, including process outcomes and clear descriptions of the intervention and controls.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.