The effect of care pathways for hip fractures: a systematic review

CRD summary
The review found that care pathways appeared to benefit patients with hip fracture, but the available evidence was too weak for formal recommendations, and more research was needed. The authors' cautious conclusion accurately reflects the inconclusive evidence presented. The overall reliability of the review is unclear due to limitations in the search, evidence synthesis, and study quality.

Authors' objectives
To evaluate the effects of care pathways for hip fractures.

Searching
PubMed (from 1975), EMBASE (from 1998), CINAHL (from 1981), Cochrane Central Register of Controlled Trials (CENTRAL), HTA database, and NHS EED were searched up to January 2011. Search terms were reported. The search was restricted to full-text articles in English, German, French, Dutch or Italian. Attempts were made to obtain full-text articles from the authors, if necessary.

Study selection
Eligible were randomised controlled trials (RCTs), controlled clinical trials, or controlled cohort studies of care pathways for patients, who had been admitted to hospital acute care or rehabilitation facilities after acute care, and had been followed-up after rehabilitation, for hip fractures. Interventions had to comply with the European Pathway Association's definition of a care pathway. All aspects of the care continuum were considered and studies had to report the clinical parameters and process of care measures, with detailed risk-adjusted analyses.

The full details were not presented, but most of the interventions were reported to be well described. They included phases of the care process (such as target setting), the clinical content of interventions (such as medications or nutrition), and their integration into the continuum of care. Few studies described the implementation of the care pathway, the presence or absence of a care co-ordinator, and the co-ordinator's role (if any). Control groups received usual care. Some studies had historical controls, with data from medical records. The studies reported a very wide range of outcomes, most of which were clinical, but some were process-related. The reported complications were overall complications, pressure ulcers, infections, and cardiac problems. None of the studies reported quality of life. Outcomes were reported at various times, ranging from in hospital to one year, for deaths. A wide variety of criteria were used to measure length of stay. Studies were set in Australia, North America, Europe, or Hong Kong and about half were conducted in teaching hospitals.

Two reviewers selected the studies, resolving disagreements by discussion with two other reviewers.

Assessment of study quality
RCTs and controlled clinical trials were assessed using the Jadad scale, with up to 5 points for the quality of the reported randomisation, double blinding, and withdrawals or dropouts. Cohort studies were assessed using the Newcastle-Ottawa scale, with up to 9 points for the quality of participant selection (0 to 4 points), baseline comparability (0 to 2 points), and ascertainment of outcomes (0 to 3 points).

The quality of the reporting was evaluated, using methods developed by the Centre for Reviews and Dissemination. Two reviewers independently conducted the assessments, resolving disagreements by discussion with two other reviewers.

Data extraction
Studies were grouped, by their reported outcomes, into the following categories: mortality, functional recovery and mobility, medical complications, hospital readmission, discharge location or destination, length of stay, and other time span measures. The reviewers extracted end values, for both groups, for each outcome, which were expressed as percentages or mean values, with probabilities for the differences between the groups (where reported).
The number of reviewers who extracted the data was not reported.

**Methods of synthesis**

Studies were combined in a narrative synthesis and in a table, which listed individual study results organised by outcome.

**Results of the review**

Twelve studies (15 publications) were included, with over 5,791 participants (range 106 to 1,341; not reported for one study). There was one quasi-RCT (n=111) and 11 cohort studies (eight with prospective controls, and three with historical controls). Study quality was acceptable. The quasi-RCT scored 1 on the Jadad scale. The cohort studies scored 7 to 9 points on the Newcastle-Ottawa scale; five had baseline imbalances in demographic or clinical characteristics, and others failed to report known predictors of functional outcomes, such as age and gender, or adjust for potential confounders.

Two of 10 studies reporting mortality found a significant benefit with the intervention, and four of six studies reporting functional recovery and mobility found a significant benefit with the intervention, for at least one outcome. Six of 11 studies reporting complications found a significant benefit with the intervention. There was no significant difference between the groups, in the other studies, for any of these outcomes (where the statistical significance of the results was reported).

Findings for length of stay were inconsistent, with eight of the 12 studies reporting a benefit with the intervention, for at least one measure, and four reporting a benefit with control. None of the six studies reporting hospital readmission rates found a significant difference between the groups. One of seven studies examining the discharge location or destination found a significant benefit, with the intervention, for discharge to home. The outcomes for a range of other process of care measures were reported.

**Cost information**

Two studies reported cost information, in Euros (EUR) or US S. One (n=112) reported a lower total cost with the intervention (EUR 9,685) than with control (EUR 15,984), and a better cost-effectiveness ratio (EUR 14,840 with the intervention versus EUR 31,908 with control). The other study found no significant difference between the groups in the mean cost per patient ($19,925 with the intervention versus $20,466 with control).

**Authors’ conclusions**

Care pathways appeared to benefit patients with hip fracture, but the available evidence was too weak for formal recommendations. More research was needed.

**CRD commentary**

The objectives and inclusion criteria were clear, and relevant sources were searched, but the restriction to published studies in five European languages meant that some studies may have been missed. The risk of publication bias was not assessed. Few demographic and clinical characteristics of the study participants were reported; the interventions and control conditions were not fully described; and the study scores for each quality criterion were not given. Most of the studies were graded as of acceptable quality, but many studies did not clearly report the selection criteria, cohort representativeness, and ascertainment of exposure; outcomes assessment was frequently based on unblinded medical record review; and adjustment for potential confounders was limited. These factors make it difficult to be confident of the reliability of the findings.

The large number of outcomes reported in the review created a risk of spurious findings. It was difficult to determine the overall effect of the intervention as vote counting did not account for differences in study size, statistical precision, and quality. There was a lot of variation in the nature and time frame of the outcomes measured. As the authors commented, many studies were small and from single centres.

The authors’ cautious conclusion accurately reflects the inconclusive evidence presented. The overall reliability of the review is unclear due to the limitations in the search, evidence synthesis, and study quality.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.

Research: The authors stated that there was a need for adequately powered, multicentre RCTs of care pathways, for in-hospital and discharge management of patients with a hip fracture. These trials should evaluate the rate of osteoporosis treatment at admission and discharge, and should report clinical, service, team, process, and financial outcomes, such as mortality, functional recovery and mobility indices, medical complications, length of stay, and cost.

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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.