The effectiveness of integrated care pathways for adults and children in health care settings:
a systematic review

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CRD summary
This review concluded that integrated care pathways were most effective where patient progress was predictable and in producing behavioural changes where service deficiencies were identified. Much of the review was well conducted, but the limited and diverse trials and acknowledged potential for publication bias make it difficult to verify the reliability of the authors’ conclusions.

Authors' objectives
To evaluate the effectiveness of successful integrated care pathways (ICPs) in children and adults over the full range of health settings, focusing on the circumstances and populations in which they were most effective.

Searching
PubMed, CINAHL, EMBASE, ASSIA, PsycINFO, the Cochrane Library, HMIC, Web of Knowledge, Scopus, Zetoc, Trip, and Current Contents were searched for publications from 1980 to March 2008, in any language, provided that there was an abstract in English. The search engine Scirus was also used and the search terms were reported. Papers were included only if English, German, or French translations were available. Sources of grey literature were also searched and these sources were listed. The bibliographies of each retrieved article, relevant reviews, and key journals were handsearched.

Study selection
High-quality randomised controlled trials (RCTs) of ICPs in health care settings, accessed by adults and children, were eligible if they reported system, process, or clinical outcomes. To be eligible, the ICP had to meet the definition developed by the European Pathway Association (see Other Publications of Related Interest). Trials were excluded if the effects of the ICP could not be distinguished from a wider quality improvement programme, if the ICP was not evaluated in a real-life health care setting, and if there were confounding variables.

The included trials evaluated ICPs in adult and paediatric services, in the secondary or tertiary sector, in developed countries. ICPs for adults included patients with fractured neck of the femur, laparotomy with intestinal or rectal resection, hip or knee arthroplasty, heart failure, and stroke. Both the ICPs for children were for the management of asthma. ICPs were developed locally for a variety of purposes and most had multiple aims, which were reported. Several interventions included education and training of staff, monitoring of staff compliance, and a dedicated co-ordinator. None of the trials reported user involvement in the development of the ICP. The outcomes were system-related and included length of stay, readmission, prescribing errors, clinical contacts, provision of information, measures of mental health, and a variety of clinical outcomes and physiological parameters.

Study selection and validity assessment seemed to be performed in the same way by two independent researchers. Any disagreements were resolved by a third reviewer. If the disagreement was due to a lack of information, the trial authors were contacted for clarification.

Assessment of study quality
Methodological quality was assessed using the criteria of the Joanna Briggs Institute checklist for experimental studies, which assesses randomisation, blinding, allocation concealment, withdrawals, intention-to-treat analysis, baseline comparability and treatment (other than the intervention) of groups and of outcome measurement, outcome measurement reliability, follow-up (more than 80%), and appropriate statistical analysis.

Two reviewers independently assessed validity and any disagreements were resolved by a third reviewer. If the disagreement was due to a lack of information, the trial authors were contacted for clarification.

Data extraction
Event rates, mean differences, and 95% confidence intervals were extracted together with their levels of statistical significance. The authors did not report how many reviewers performed the data extraction.

**Methods of synthesis**
A narrative summary of the results was provided, due to the heterogeneity of the included trials.

**Results of the review**
Seven RCTs, published in nine papers between 1980 and 2008, were included (984 patients, range 64 to 251); five RCTs were of adults and two were of children.

ICPs effectively supported proactive care management for predictable care pathways (six RCTs); promoted adherence to guidelines or treatment protocols (three RCTs); improved documentation of treatment goals and communication with patients, carers and health professionals (two RCTs); improved physicians' agreement with treatment options (one RCT); and supported decision-making (two RCTs).

ICPs might be effective in changing professional behaviour where there was scope for improvement or with new roles or in contexts where professionals were already experienced (number of trials not reported).

ICPs were less effective in improving service quality and efficiency where there were variable patient trajectories and in bringing about quality improvements where services were already based on the best evidence and multidisciplinary working was well established (one RCT). They might be more effective for certain patient subgroups than for others (one RCT) and they might require supporting mechanisms, particularly where a significant change in organisational culture was required (one RCT). ICP documentation could introduce new types of error (one RCT).

The authors also reported other circumstances in which ICPs were not effective and discussed the active ingredients of ICPs and the generative mechanisms through which ICPs produced effects.

Some significant clinical benefits with ICPs were reported in single trials of acute asthma/wheeze in children, in-patient paediatric asthma management, patients after joint replacement, and hospital patients with heart failure. Two RCTs showed no statistically significant benefit of the ICP for clinical outcomes. It was difficult to assess the impact of the ICP in another RCT due to differences in the clinical care given to the intervention and control groups.

**Authors' conclusions**
ICPs were most effective in contexts where the patient's progress was predictable; where recovery pathways were more variable, their value was less clear. They were most effective in bringing about behavioural changes where deficiencies in services were identified; where professional working was well established, their value was less certain. The authors noted that some of these changes in professional behaviour did not benefit patients.

**CRD commentary**
The research question was clear and the inclusion criteria for study design and intervention were specified. The criteria for participants and outcomes were appropriately broad. Many relevant sources, including grey literature, were searched, but the authors acknowledged that all of the included trials were about successfully developed and implemented pathways and there was potential for publication bias. Some attempts were made to minimise language bias and methods were used to minimise reviewer errors and bias in quality assessment, but it was not clear whether similar steps were taken for data extraction and study selection. Only RCTs were included and their quality was assessed, using specified criteria, but the results were not presented, which makes it difficult to verify the quality of the evidence. The authors discussed some of the methodological limitations of the individual trials and, given the differences between them, a narrative synthesis was appropriate. Summarising trials with diverse aims and outcomes can be difficult.

Much of the review was well conducted, but the limited and diverse trials and the acknowledged potential for publication bias make it difficult to verify the reliability of the authors' conclusions.

**Implications of the review for practice and research**
Practice: The authors stated that due to the cost of ICP development, they should be targeted at areas with clearly identified deficiencies in provision or where change was required. ICP developers should specify how they wish to
change practice, the generative mechanism, and the patient population and subgroups for which it might not be appropriate. The intended changes should fit best practice. ICPs could make best practice guidelines available for daily practice, in a usable form. Where the care pathway is more variable, ICPs should account for this and when adherence to the pathway is not in the patient’s best interest, staff should be supported in exercising their professional judgment.

**Research**: The authors stated that primary research on ICPs, with a clear purpose, was required to provide stronger evidence on their active ingredients, their generative mechanisms, and their inter-relationships. Evaluations of ICP research should include details of the intervention and its processes to support development, implementation, and sustainability and details of the local context and its critical success factors. They should also include theory-based outcome and process measures that take into account the wider system and the perspectives of all stakeholders and they should aim to understand the reasons for behavioural change or absence of it, with respect to context, mechanism, and outcome. An economic evaluation should identify whether the benefits justify the costs of implementation.

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