Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs

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The use of clinical pathways appears to have a favourable impact on patient outcomes, length of hospital stay, hospital costs and professional practice. In under-resourced settings, an important obstacle to the use of clinical pathways could relate to their development and/or adaptation to the specific circumstances of each site.

RHL commentary by Haddad SM

1. INTRODUCTION

Health-care professionals frequently request systematic evidence-based guidance to facilitate decision-making in the provision of clinical care. They also need adequate support from hospital management to lead changes in practice (1). One approach to the provision of such guidance is the use of clinical pathways as an implementation tool. Clinical pathways are structured multidisciplinary care plans containing detailed essential steps in the care of patients with specific clinical problems. They are often developed by translating guidelines into local protocols for application in clinical practice (2). Although clinical pathways are being used worldwide, evidence about their usefulness has been unclear. This review (3) assesses the available evidence for the impact of use of clinical pathways on professional practice, patient outcomes (e.g. mortality, complications), length of hospital stay and hospital costs.

2. METHODS OF THE REVIEW

The review authors sought randomized controlled trials, controlled clinical trials, controlled before-and-after studies, and interrupted time series analysis. They searched the Database of Abstracts of Reviews of Effectiveness (DARE) for related reviews, the EPOC Register, The Cochrane Central Register of Controlled Trials, bibliographical databases (MEDLINE, EMBASE, CINAHL, NHS EED, Global Health) and other sources, such as references lists. They also contacted authors and health-care professionals to ensure that their search was comprehensive.

To assess the available studies, the review authors used the methodological design and quality criteria of the Effective Practice and Organization of Care (EPOC). The intervention searched was implementation of clinical pathways aimed at guiding patient management for a specified condition or use of clinical pathways within multifaceted interventions in comparison to usual care. The outcomes measured were divided into patient outcomes, professional practice, length of stay in hospital and hospital costs.
In the review, all variables are described according to the literature (clinical pathways, multifaceted strategies) and the classification criteria selected for each variable was used as a guide to quality assessment of study methods.

3. RESULTS OF THE REVIEW

Out of 3214 papers screened for potential inclusion, 27 studies (involving 11,398 participants) met the inclusion criteria. They were conducted in Australia, Canada, Japan, Norway, Taiwan, Thailand, United Kingdom and the USA. Twenty studies had compared a stand-alone clinical pathway to usual care and seven had compared a multifaceted intervention including a clinical pathway to usual care.

In the 27 studies, 19 different conditions had been targeted, 16 of which related to clinical pathways for non-invasive diagnosis (e.g. diabetes, stroke, asthma), nine for invasive procedures (surgery, clinical procedures or mechanical ventilation) and two combining both. Length of stay in hospital was the most commonly employed outcome measured. Out of the 20 studies categorized as single-pathway interventions, 15 (75%) primary studies examined the effect of clinical pathways on length of hospital stay. Heterogeneity between this subgroup of studies reporting length of hospital stay was substantial ($I^2 = 62\%$), which prevented the review authors from conducting a meta-analysis. However, when length of hospital stay was analysed by clinical condition or intervention, the studies showed a positive impact. For instance, length of stay decreased $1.67$ days [95% confidence interval (CI) $2.73$ to $0.62$] for inpatient management of pneumonia in the clinical pathways group (2 studies, 272 participants), and there was a reduction of $33.72$ hours (95% CI $55.73$ to $11.71$) for the duration of mechanical ventilation in the intervention group (2 studies, 678 participants).

Similar to the analysis of length of hospital stay, statistical inconsistency within both subgroups of 'hospital charges' ($I^2 = 69\%$) and 'hospital costs' ($I^2 = 66\%$) was substantial and compromised the estimation of a pooled effect. However, the order of magnitude of the reported effects of clinical pathways on hospital costs/charges indicated that there are considerable benefits of using clinical pathways. Pooling eight standardized mean differences in hospital costs, charges and insurance points, a decrease was seen in resource use in the intervention group ($0.52$; 95% CI $0.78$ to $0.26$).

In-hospital complications, such as infection and deep vein thrombosis, were measured in five studies (664 participants) and all reported improvements associated with the use of a clinical pathways. The combined odds ratio for complications was $0.58$ (95% CI $0.36$–$0.94$). Six measurements were comparable in terms of hospital re-admission reported for all causes, and characterized with follow-up periods of up to 6 months. The pooled odds ratio for re-admission was $0.6$ (95% CI $0.32$–$1.13$), which was not statistically significant.

Within the subgroup of single-pathway interventions, three studies (1187 participants) were comparable and reported in-hospital mortality rates. The pooled odds ratio for in-hospital mortality was $0.84$ (95% CI $0.64$–$1.11$) in favour of clinical pathways but did not reach statistical significance. Although with regard to professional practice there was considerable heterogeneity between the studies, the results show a positive impact on quality and quantity of documentation in medical records for the use of clinical pathways.

4. DISCUSSION

4.1 APPLICABILITY OF THE RESULTS
The use of clinical pathways is likely to have a favourable impact on patient outcomes, length of hospital stay, hospital costs and professional practice; no adverse consequences were reported with their use. Almost all the studies included in the review were conducted in developed countries. This may limit the applicability of the findings of the review in those settings. An important stumbling block in this regard could relate to the development and/or adaptation of clinical pathways to the specific circumstances of each site; facilities in under-resourced settings can vary considerably in terms of human and material resources and therefore adaptation of clinical pathways to the local factors is likely to be crucial.

### 4.2 IMPLEMENTATION OF THE INTERVENTION

The studies included in the review reported few details on the strategies used to implement the interventions. This may make them difficult to reproduce. It has been suggested that strategies aimed at quality improvements in health care and educational activities aimed at health-care professionals should be informed not only by the findings of systematic reviews, but also by studies on professional behaviour change interventions (4). Hence, the process of improving any current practice should begin with a search and grading of the best available evidence. Development of clinical pathways should be undertaken by a team of professionals who are involved in all steps of the continuum of care. Each pathway should then be adapted to the local conditions. The implementation process for clinical pathways should ideally involve: (i) making baseline measurements before the introduction of the pathway; (ii) identification and documentation of barriers faced during the implementation phase; and (iii) use of reminders, educational sessions, opinion leaders and audit and feedback to reinforce behaviour change.

### 4.3 IMPLICATIONS FOR RESEARCH

Further studies should address the effects of the use of clinical pathways in specific conditions with standard methods in order to achieve homogenous and comparable results. Such studies should also strive to document the implementation process in detail to facilitate reproducibility.

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**References**


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