

Clinical Pathways: Effects on Practice, Outcomes, and Costs

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The Cochrane Abstract on the next page is a summary of a review from the Cochrane Library. It is accompanied by an interpretation that will help clinicians put evidence into practice. Dr. Seehusen presents a clinical scenario and question based on the Cochrane Abstract, followed by an evidence-based answer and a critique of the review. The practice recommendations in this activity are available at <http://www.cochrane.org/reviews/en/ab006632.html>.



This clinical content conforms to AAFP criteria for evidence-based continuing medical education (EB CME). See CME Quiz on page 1325.

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A collection of Cochrane for Clinicians published in *AFP* is available at <http://www.aafp.org/afp/cochrane>.

Clinical Scenario

A patient with pneumonia has the option of going to one of two hospitals for treatment. Only one of the hospitals has implemented clinical pathways for pneumonia. The patient's referring physician questions whether a clinical pathway would be beneficial.

Clinical Question

Do clinical pathways have a positive effect on professional practice, patient outcomes, hospital costs, or length of stay?

Evidence-Based Answer

The results of 27 studies ($n = 11,398$) support the conclusion that clinical pathways reduce in-hospital complications and improve documentation.¹ (Strength of Recommendation = A, based on consistent, good-quality patient-oriented evidence) The evidence suggests that hospital length of stay and costs are reduced, but it is too heterogeneous to make any conclusive statements. (Strength of Recommendation = B, based on inconsistent or limited-quality patient-oriented evidence)

Practice Pointers

Clinical pathways, also known as critical or integrated pathways, have become a popular way of attempting to positively influence patient care. Definitions of clinical pathways generally emphasize that pathways are structured, multidisciplinary, and centered on one specific medical condition.² They are designed based on the best available evidence for purposes such as improving clinical outcomes, improving resource management, and reducing the cost of medical therapy.³

Given the growing emphasis on evidence-based practice, it is not surprising that more than 80 percent of U.S. hospitals employ clinical pathways.¹ However, the true effectiveness of clinical pathways is not known.

Thousands of clinical pathways have been described in the medical literature, including some high-quality primary research reports.⁴ A few systematic reviews or meta-analyses of clinical pathways have been conducted for single diseases or procedures.⁵⁻⁷

The goal of this Cochrane review was to evaluate clinical pathways in general, across disease processes.¹ The authors identified 27 studies that met their inclusion criteria based on the quality of the clinical pathway implementation and reporting. These studies looked at a variety of clinical situations, with variability resulting in an inability to perform meta-analysis on many of the authors' desired end points, highlighting the need for standardization of methods for clinical pathway implementation, evaluation, and reporting.

Length of stay was the most commonly reported measure. Although 11 of 15 studies reported a reduction in the average length of stay, two reports on clinical pathways in stroke rehabilitation showed an increased length of stay. The heterogeneity of the studies prevented the authors from conducting a meta-analysis (i.e., combining data from different studies to estimate the overall effect). However, given that the majority of studies had a positive effect and that the magnitude of the effect in those studies was clinically meaningful, there is good reason to suggest that clinical pathways can reduce length of stay.

Differences in billing practices, currency, and publication year made direct comparisons difficult. The methods of billing differed because studies varied considerably in how costs were calculated and in their country of origin. Pooled analysis of eight studies showed a "moderate" decrease in costs when clinical pathways were used (standard mean difference = -0.52 ; 95% confidence interval, -0.78 to -0.26). The authors concluded

Cochrane Abstract

Background: Clinical pathways are structured multidisciplinary care plans used by health services to detail essential steps in the care of patients with a specific clinical problem. They aim to link evidence to practice and optimize clinical outcomes while maximizing clinical efficiency.

Objectives: To assess the effect of clinical pathways on professional practice, patient outcomes, length of stay, and hospital costs.

Search Strategy: The authors searched the Database of Abstracts of Reviews of Effectiveness (DARE), the Effective Practice and Organization of Care (EPOC) Register, the Cochrane Central Register of Controlled Trials (CENTRAL), and bibliographic databases including Medline, EMBASE, CINAHL, NHS EED, and Global Health. They also searched the reference lists of relevant articles and contacted relevant professional organizations.

Selection Criteria: Randomized controlled trials, controlled clinical trials, controlled before-and-after studies, and interrupted time series studies comparing stand-alone clinical pathways with usual care as well as clinical pathways as part of a multifaceted intervention with usual care.

Data Collection and Analysis: Two review authors independently screened all trials to assess eligibility and methodologic quality. Studies were grouped into those comparing clinical pathways with usual care and those comparing clinical pathways as part of a multifaceted intervention with usual care.

Main Results: Twenty-seven studies involving 11,398 participants met the eligibility and study quality criteria for inclusion. Twenty studies compared stand-alone clinical pathways with usual care. These studies indicated a reduction in in-hospital complications (odds ratio = 0.58; 95% confidence interval, 0.36 to 0.94) and improved documentation (odds ratio = 11.95; 95% confidence interval, 4.72 to 30.30). There was no evidence of differences in readmission to hospital or in-hospital mortality. Length of stay was the most commonly reported outcome measure, with most studies reporting significant reductions. Decreases in hospital costs and charges (measured in U.S. dollars standardized to the year 2000) were also observed, ranging from weighted mean differences of +\$261 favoring usual care to -\$4,919 favoring clinical pathways. Considerable heterogeneity prevented meta-analysis of length-of-stay and hospital cost results. An assessment of whether lower hospital costs contributed cost shifting to another health sector was not undertaken. Seven studies compared clinical pathways as part of a multifaceted intervention with usual care. No evidence of differences was found between intervention and control groups.

Authors' Conclusions: Clinical pathways are associated with reduced in-hospital complications and improved documentation without negatively affecting length of stay and hospital costs.



These summaries have been derived from Cochrane reviews published in the Cochrane Database of Systematic Reviews in the Cochrane Library. Their content has, as far as possible, been checked with the authors of the original reviews, but the summaries should not be regarded as an official product of the Cochrane Collaboration; minor editing changes have been made to the text (<http://www.cochrane.org>).

that, at a minimum, clinical pathways do not appear to increase costs. However, they pointed out that reduced hospital costs do not guarantee that other health costs do not increase correspondingly.

All seven studies reporting patient complications found lower rates when clinical pathways were used. Complication rates were reported in five studies of postsurgical patients. Pooling of these results found an odds ratio of 0.58 (95% confidence interval, 0.36 to 0.94) favoring the use of clinical pathways. This equates to an absolute risk reduction of 5.6 percent in patients recovering from a surgical procedure, or a number needed to treat of 17. Results for specific complications could not be obtained because there were not enough studies looking at the same diagnosis or procedure included in the meta-analysis. Pooled hospital readmission rates did not reach statistical significance, but all reporting studies found a trend toward improvement with clinical pathways. Similarly, in-hospital mortality favored use of clinical pathways but did not reach statistical significance.

Three studies found a positive effect on the quantity or quality of documentation. The authors concluded there was enough evidence to suggest that clinical pathways improved documentation, despite their inability to do a pooled analysis. The studies did not address the question

of whether improved documentation led to any actual improvements in the quality of patient care.

The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Department of Defense, the U.S. Army Medical Corps, or the U.S. Army at large.

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Author disclosure: Nothing to disclose.

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Cochrane Briefs

Chest Physiotherapy for Pneumonia in Adults

Clinical Question

Does chest physiotherapy improve outcomes for adults with pneumonia?

Evidence-Based Answer

There is little evidence to support the effectiveness of chest physiotherapy for adults with pneumonia. In two small studies by the same investigator, only osteopathic manipulation was shown to improve some outcomes (i.e., length of stay and duration of antibiotic therapy). (Strength of Recommendation = B, based on inconsistent or limited-quality patient-oriented evidence)

Practice Pointers

Chest physiotherapy includes a variety of techniques, such as conventional chest physiotherapy (i.e., percussion and postural drainage), active cycle of breathing techniques, positive expiratory pressure (using devices to maintain 10 to 25 cm of water pressure during expiration), and osteopathic manipulation. In theory, these techniques could help keep airways open, improve secretion clearance, and increase gas exchange. Results from previous studies have been mixed, and there were no previous systematic reviews.

The authors of the Cochrane review identified six studies of chest physiotherapy in adult patients with acute pneumonia (n = 434). They did not include seven other studies that initially appeared to meet their inclusion criteria because five of them were published in Russian, one was unpublished, and one was published in 1947 and not available to the authors. All of the included studies were randomized; three of the studies blinded participants, two blinded outcome assessors, and three concealed allocation. Each patient received routine treatment (e.g., antibiotics, oxygen therapy). Additional treatment with chest physiotherapy was compared with placebo therapy in two of the studies, and with no therapy (i.e., routine treatment alone) in four of the studies. None of the interventions improved mortality or cure rate. Osteopathic manipulation, studied in two double-blinded, sham-controlled trials with 79 patients, appeared to reduce hospital length of stay by a mean of two days and the duration of antibiotic therapy.

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Author disclosure: Dr. Ebell is Editor in Chief of Essential Evidence, published by John Wiley & Sons, Inc., who also publish The Cochrane Library.

SOURCE: Yang M, Yuping Y, Yin X, et al. Chest physiotherapy for pneumonia in adults. *Cochrane Database Syst Rev.* 2010;(2):CD006338. ■

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Support made possible by the AAFP Foundation, through a grant from Pfizer Inc.

