



August 2016 – SUPPORT Summary of a systematic review

## How do clinical pathways affect patient outcomes, professional practice and hospital costs?

Clinical pathways are structured multidisciplinary care plans used by healthcare providers to detail essential steps in the care of patients with a specific clinical problem. The use of clinical pathways is intended to link evidence to practice and to optimise clinical outcomes whilst maximising clinical efficiency.

### Key messages

- **Clinical pathways compared to usual care in hospitals probably decrease the length of stay and may decrease complications and hospital readmissions.**
- **It is uncertain whether clinical pathways reduce in-hospital mortality or hospital costs.**
- **Multifaceted interventions that include a clinical pathway probably lead to little or no difference in hospital mortality and may lead to little or no difference in length of stay or hospital costs.**
- **It is uncertain whether multifaceted interventions that include a clinical pathway decrease hospital complication or readmissions.**
- **Almost all the evaluations of clinical pathways have been conducted in high-income economies.**

### Who is this summary for?

People making decisions about the implementation of guidelines for specific health conditions into clinical practice

#### ! This summary includes:

- **Key findings** from research based on a systematic review
- **Considerations about the relevance of this research** for low-income countries

#### X Not included:

- Recommendations
- Additional evidence not included in the systematic review
- Detailed descriptions of interventions or their implementation

### This summary is based on the following systematic review:

Rotter T, Kinsman L, James EL, et al. Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. Cochrane Database of Systematic Reviews 2010, Issue 3. Art. No.: CD006632.

### What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from the included studies

**SUPPORT** was an international project to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries, funded by the European Commission (FP6) and the Canadian Institutes of Health Research.

**Glossary of terms used in this report:**  
[www.supportsummaries.org/glossary-of-terms](http://www.supportsummaries.org/glossary-of-terms)

**Background references on this topic:**  
See back page

# Background

Clinical pathways are defined as structured multidisciplinary care plans that detail essential steps in the care of patients with a specific clinical problem. These pathways support the translation of clinical guidelines into local protocols and clinical practice for specific health conditions in order to optimise patient outcomes whilst maximising efficiency. Whilst clinical guidelines provide generic recommendations, clinical pathways detail the local structure, systems and time frames needed to address these recommendations.

In this review, clinical pathways were regarded as any multidisciplinary plan of care in which the intervention also fulfilled at least three of the following four criteria: the intervention was used to channel the translation of guidelines or evidence into local structures; it detailed the steps in a course of treatment or care in a plan, pathway, algorithm, guideline, protocol or other inventory of actions; it had a time frame for criteria-based progression (i.e. steps were taken if the designated criteria were met); and it aimed to standardise care for a specific clinical problem, procedure or episode of care in a specific population.

## How this summary was prepared

After searching widely for systematic reviews that can help inform decisions about health systems, we have selected ones that provide information that is relevant to low-income countries. The methods used to assess the reliability of the review and to make judgements about its relevance are described here:

[www.supportsummaries.org/how-support-summaries-are-prepared/](http://www.supportsummaries.org/how-support-summaries-are-prepared/)

## Knowing what's not known is important

A reliable review might not find any studies from low-income countries or might not find any well-designed studies. Although that is disappointing, it is important to know what is not known as well as what is known.

A lack of evidence does not mean a lack of effects. It means the effects are uncertain. When there is a lack of evidence, consideration should be given to monitoring and evaluating the effects of the intervention, if it is used.

## About the systematic review underlying this summary

**Review objective:** To assess the effect of clinical pathways on professional practice, patient outcomes, length of stay and hospital costs

Types of	What the review authors searched for	What the review authors found
<b>Study designs &amp; Interventions</b>	Randomized trials, non-randomized trials, controlled before-after studies and interrupted time series studies evaluating clinical pathways	19 randomized trials, 4 controlled before-after studies and 2 interrupted time series studies. Twenty studies compared a stand-alone clinical pathway to usual care and seven compared a multifaceted intervention that included a clinical pathway to usual care.
<b>Participants</b>	Health professionals in a hospital setting, hospitalised patients, and hospitals	Health professionals, hospitalised patients and hospitals
<b>Settings</b>	Hospitals	General acute ward (15 studies), extended stay facility (4), intensive care unit (4), emergency department (3) and mental health outpatient clinic (1). Only one study was conducted in a middle-income country (Thailand). All the other studies were conducted in high income economies; USA (13), Australia (4), Japan (3), UK (2), Canada (2), (1), Taiwan (1) and Norway (1).
<b>Outcomes</b>	Patient outcomes, professional practice, length of stay and hospital costs	Complications (6 studies), readmission to hospital (8), length of stay (17), in-hospital mortality (5), and hospital costs (11)
<b>Date of most recent search:</b> April 2008		
<b>Limitations:</b> This is a well-conducted systematic review with only minor limitations.		

Rotter T, Kinsman L, James EL, et al. Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. Cochrane Database of Systematic Reviews 2010, Issue 3. Art. No.: CD006632.

# Summary of findings

This review identified 27 studies (11,398 participants), mostly in high-income country settings. Collectively, these evaluated a wide range of different types of clinical pathways in different settings and for different conditions. Twenty studies compared clinical pathways with usual care and seven studies compared multifaceted interventions that included a clinical pathway with usual care.

## 1) Clinical pathways versus usual care

The clinical pathways in the studies addressed stroke rehabilitation, pneumonia, suspected myocardial infarction, mechanical ventilation, transurethral resection of the prostate, menorrhagia and urinary incontinency, femoral neck fracture, laparotomy and intestinal resection, asthma care, hip and knee arthroplasty, asthma in children, atrial fibrillation, gastrectomy, chronic pulmonary disease, and domestic violence.

- **Clinical pathways compared to usual care probably decrease the length of stay in hospitals. The certainty of this evidence is moderate.**
- **Clinical pathways may decrease complications and hospital readmissions. The certainty of this evidence is low.**
- **It is uncertain whether clinical pathways reduce in-hospital mortality or hospital costs because the certainty of this evidence is very low.**

### About the certainty of the evidence (GRADE) \*



**High:** This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.



**Moderate:** This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate.



**Low:** This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.



**Very low:** This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

\* This is sometimes referred to as 'quality of evidence' or 'confidence in the estimate'.

† Substantially different = a large enough difference that it might affect a decision

See last page for more information.

<b>Clinical pathways alone versus usual care</b>		
<b>People</b>	Health professionals, hospitalised patients or hospitals	
<b>Settings</b>	Hospitals	
<b>Intervention</b>	Clinical pathways alone	
<b>Comparison</b>	Usual care	
<b>Outcomes</b>	<b>Impact</b>	<b>Certainty of the evidence (GRADE)</b>
<b>Complications</b>	All the studies reported reductions in hospital complications (odds ratio (OR) 0.58; 95% confidence interval (CI): 0.36 to 0.94).	⊕⊕○○ Low
<b>Hospital readmission</b>	Clinical pathways may decrease hospital readmissions (OR 0.6; 95% CI: 0.32 to 1.13)	⊕⊕○○ Low
<b>In-hospital mortality</b>	The effect of clinical pathways on in-hospital mortality is uncertain (OR 0.84; 95% CI: 0.61 to 1.11)	⊕○○○ Very low
<b>Length of stay</b>	11 of the 14 studies reported a reduction in the length of hospital stay. The effect was greater in some countries (for example, greater in Japan, lower in the USA).	⊕⊕⊕○ Moderate
<b>Hospital costs</b>	Hospital costs/charges increased in some studies and decreased in others. The changes ranged from a US\$ 261 increase to a reduction of US\$ 4919 for clinical pathways compared to usual care. Overall, the studies reported a moderate decrease in costs (Standardised Mean Difference -0.52; 95% CI: -0.78 to -0.26).	⊕○○○ Very low
GRADE: GRADE Working Group grades of evidence (see above and last page)		

## 2) Multifaceted intervention that included a clinical pathway compared to usual care

The review found studies addressing multifaceted interventions which included a clinical pathway for: bipolar disorder, palliative care, mechanical ventilation, asthma in children, delirium in older medical patients, diabetic patients admitted with hypoglycaemia, and heart failure.

- Multifaceted interventions that include a clinical pathway probably lead to little or no difference in hospital mortality. The certainty of this evidence is moderate.
- Multifaceted interventions that include a clinical pathway may have little or no effect on the length of hospital stays or hospital costs. The certainty of this evidence is low.
- It is uncertain whether multifaceted interventions that include a clinical pathway decrease hospital complications or readmissions cause the certainty of this evidence is very low.

Multifaceted interventions that include a clinical pathway compared to usual care		
<b>People</b>	Health professionals, hospitalised patients or hospitals	
<b>Settings</b>	Hospital	
<b>Intervention</b>	Multifaceted interventions that include a clinical pathway	
<b>Comparison</b>	Usual care	
Outcomes	Impact	Certainty of the evidence (GRADE)
<b>Complications</b>	1 study evaluating a multifaceted intervention including a clinical pathway for end-of-life care found a reduction in the number of complications (4.8 to 3.7; $p = 0.014$ ). Two other studies reporting the process of care instead of actual complications found no beneficial effects.	⊕○○○ Very low
<b>Hospital readmission</b>	It is uncertain whether multifaceted interventions that include a clinical pathway reduce hospital readmissions.	⊕○○○ Very low
<b>In-hospital mortality</b>	There was little or no reduction in hospital mortality (SMD -0.06; 95% CI -0.15 to 0.03).	⊕⊕⊕○ Moderate
<b>Length of stay</b>	There was little or no reduction in the length of hospital stay (WMD -0.86 days; 95%CI -2.52 to 0.81).	⊕⊕○○ Low
<b>Hospital costs</b>	There was little or no reduction in hospital costs.	⊕⊕○○ Low
CI: Confidence interval; p: P-value; SMD: Standard mean difference; WMD: Weighted mean difference; GRADE: GRADE Working Group grades of evidence (see above and last page)		

# Relevance of the review for low-income countries

→ Findings	▷ Interpretation*
<b>APPLICABILITY</b>	
<ul style="list-style-type: none"><li>→ Clinical pathways probably decrease the length of hospital stay and may decrease complications and hospital readmissions. It is uncertain whether they reduce in-hospital mortality.</li><li>→ Multifaceted interventions that include a clinical pathway probably lead to little or no difference in hospital mortality, may lead to little or no difference in length of hospital stay and hospital costs, and it is uncertain whether they decrease hospital complications or readmissions.</li><li>→ Almost all the studies have been conducted in high-income economies.</li></ul>	<ul style="list-style-type: none"><li>▷ The effects and costs of clinical pathways are largely uncertain.</li><li>▷ Clinical pathways are typically complex interventions and their structures and processes can vary widely according to the condition addressed, the scope of work, the number and quality of the tasks involved, etc. The effects they have will depend on the quality of the clinical evidence supporting the individual components of the pathway.</li><li>▷ There are many ways in which healthcare teams in high-income and low-income countries may differ. The organisational culture, the commitment to quality and safety, the resources needed for documenting the process (e.g. electronic health records), are among the issues that need to be considered, particularly when implementing interventions in low-income settings.</li></ul>
<b>EQUITY</b>	
<ul style="list-style-type: none"><li>→ The studies did not directly address equity.</li></ul>	<ul style="list-style-type: none"><li>▷ Clinical pathways may have potentially positive impacts on health equity. For instance, improvements in levels of staff satisfaction (through the use of multidisciplinary approaches or the provision of good quality care) may improve the retention of healthcare professionals in underserved areas.</li></ul>
<b>ECONOMIC CONSIDERATIONS</b>	
<ul style="list-style-type: none"><li>→ The studies measured costs in different ways. Although studies suggest a moderate reduction in costs, the impacts on costs are uncertain because the certainty of the evidence is very low.</li><li>→ Multifaceted interventions that include a clinical pathway may not lead to any difference in the length of hospital stay or hospital costs.</li></ul>	<ul style="list-style-type: none"><li>▷ The structure and specific tasks associated with a particular clinical pathway will determine the costs.</li><li>▷ If clinical pathways are able to reduce the length of hospital stay and ensure better coordination of care, this may lead to long-term cost savings.</li><li>▷ The benefits and cost-effectiveness of clinical pathways are uncertain. These should therefore be investigated on a case-by-case basis.</li></ul>
<b>MONITORING &amp; EVALUATION</b>	
<ul style="list-style-type: none"><li>→ The beneficial effects of clinical pathways on patient outcomes are largely uncertain.</li></ul>	<ul style="list-style-type: none"><li>▷ Cross-study comparisons of clinical pathway interventions are problematic. Future evaluations of clinical pathways should be well-designed randomized trials and should clearly describe the intervention.</li><li>▷ Well-designed studies evaluating clinical pathways are needed before clinical pathways are implemented on a large scale in low-income countries.</li></ul>

\*Judgements made by the authors of this summary, not necessarily those of the review authors, based on the findings of the review and consultation with researchers and policymakers in low-income countries. For additional details about how these judgements were made see: [www.supportsummaries.org/methods](http://www.supportsummaries.org/methods)

# Additional information

## Related literature

Campbell H, Hotchkiss R, Bradshaw N, Porteous M. Integrated care pathways. *Journal of Integrated Care Pathways*. 1998;316(7125):133–7.

## This summary was prepared by

Gabriel Rada, Unit for Health Policy and Systems Research, Faculty of Medicine, Pontificia Universidad Católica de Chile, Chile

## Conflict of interest

None declared. For details, see: [www.supportsummaries.org/coi](http://www.supportsummaries.org/coi)

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## This review should be cited as

Rotter T, Kinsman L, James EL, et al. Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. *Cochrane Database of Systematic Reviews* 2010, Issue 3. Art. No.: CD006632.

## The summary should be cited as

Rada G. How do clinical pathways affect patient outcomes, professional practice and hospital costs? A SUPPORT Summary of a systematic review. August 2016. [www.supportsummaries.org](http://www.supportsummaries.org)

## About certainty of the evidence (GRADE)

The “certainty of the evidence” is an assessment of how good an indication the research provides of the likely effect; i.e. the likelihood that the effect will be substantially different from what the research found. By “substantially different” we mean a large enough difference that it might affect a decision. These judgements are made using the GRADE system, and are provided for each outcome. The judgements are based on the study design (randomised trials versus observational studies), factors that reduce the certainty (risk of bias, inconsistency, indirectness, imprecision, and publication bias) and factors that increase the certainty (a large effect, a dose response relationship, and plausible confounding). For each outcome, the certainty of the evidence is rated as high, moderate, low or very low using the definitions on page 3.

**For more information about GRADE:**  
[www.supportsummaries.org/grade](http://www.supportsummaries.org/grade)

## SUPPORT collaborators:

**The Cochrane Effective Practice and Organisation of Care Group (EPOC)** is part of the [Cochrane Collaboration](http://www.cochrane.org). The Norwegian EPOC satellite supports the production of Cochrane reviews relevant to health systems in low- and middle-income countries. [www.epocoslo.cochrane.org](http://www.epocoslo.cochrane.org)

**The Evidence-Informed Policy Network (EVIPNet)** is an initiative to promote the use of health research in policymaking in low- and middle-income countries. [www.evipnet.org](http://www.evipnet.org)

**The Alliance for Health Policy and Systems Research (HPSR)** is an international collaboration that promotes the generation and use of health policy and systems research in low- and middle-income countries. [www.who.int/alliance-hpsr](http://www.who.int/alliance-hpsr)

**Norad**, the Norwegian Agency for Development Cooperation, supports the Norwegian EPOC satellite and the production of SUPPORT Summaries. [www.norad.no](http://www.norad.no)

**The Effective Health Care Research Consortium** is an international partnership that prepares Cochrane reviews relevant to low-income countries. [www.evidence4health.org](http://www.evidence4health.org)

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