



March 2017 – SUPPORT Summary of a systematic review

Does medication review for hospitalised patients reduce morbidity and mortality?

Medication review is sometimes used to prevent adverse drug events in adult hospitalised patients. It can be defined as a systematic assessment of the pharmacotherapy of an individual patient that aims to optimise patient medication.

Key messages

- Medication review may lead to little or no difference in mortality or hospital re-admissions.
- Medication review may reduce hospital emergency department contacts.
- None of the studies were conducted in a low- or middle-income country.



Who is this summary for?

People deciding whether to introduce medication review for hospitalised patients to reduce morbidity and mortality

! 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:

Christensen M, Lundh A. Medication review in hospitalised patients to reduce morbidity and mortality. Cochrane Database Syst Rev 2016; (2): CD008986.

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

Background references on this topic:
See back page

Background

Using many drugs is linked to an increased risk of adverse drug events, drug interactions, poorer drug adherence, hospital admissions and even drug related deaths. Medication review is intended to improve quality of prescribing and prevention of adverse drug events. Medication review aims to evaluate and optimise patient medication by a change (or not) in prescription, either by a recommendation or by a direct change. Medication review involves evaluating the therapeutic efficacy and harms of each drug in relation to the conditions being treated. Other issues, such as adherence, interactions between different medications, biochemical monitoring and the patient's understanding of the condition and treatment could also be considered, when appropriate. Medication review could also include identifying the most accurate list of medications a patient is taking and using that list to provide correct pharmacotherapy, especially during transitions in care.

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/

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 whether medication review improves health outcomes of hospitalised adult patients.

Types of	What the review authors searched for	What the review authors found
Study designs & Interventions	Randomised trials, including cluster-randomised trials, assessing medication review	10 randomised trials were included. The medication review was performed by a pharmacist (4 trials), by a team of pharmacists and pharmacy technicians (1 trial), by a physician (2 trials), by a pharmacist or a physician (1 trial) and by a team of pharmacists and physicians (2 trials). The medication review ended with a written recommendation to the prescribing physicians, sometimes combined with drug counselling, patient education and telephone follow-up. 7 trials provided additional interventions besides medication review.
Participants	Hospitalised adult patients receiving medication review by a physician, pharmacist or other healthcare professional	Participants were elderly with a mean age around 80 years in all trials except 3, in which the mean participant age was 59, 61 and 70 years.
Settings	Hospital setting, worldwide.	USA (2) and Europe (Belgium, Denmark, Ireland, Northern Ireland, and Sweden) (8).
Outcomes	Mortality, hospital readmission, hospital emergency department contacts (all-cause and due to adverse drug events), and adverse drug events.	Mortality (9 trials), hospital readmissions (7, with 1 due to adverse drug events), hospital emergency department contacts (4, with 1 due to adverse drug events), and adverse drug events (1).

Date of most recent search: May 2015

Limitations: This is well-conducted systematic review with only minor limitations.

Christensen M, Lundh A. Medication review in hospitalised patients to reduce morbidity and mortality. Cochrane Database Syst Rev 2016; (2): CD008986.

Summary of findings

Ten studies were included.

- Medication review may lead to little or no difference in mortality or hospital readmissions. The certainty of this evidence is low.
- Medication review may reduce hospital emergency department contacts. The certainty of this evidence is 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.

Medication review compared with standard care for hospitalised adult patients				
People	Hospitalised adult patients			
Settings	Hospital settings in Europe and the USA			
Intervention	Medication review			
Comparison	Standard care			
Outcomes (due to all-cause at 1 year)	Without Medication review	With Medication review	Relative effect (95% CI)	Certainty of the evidence (GRADE)
	Absolute effect (95% CI)			
Mortality (all cause) Low risk	200 per 1000	204 per 1000 (174 to 238)	RR 1.02 (0.87 to 1.19)	⊕⊕○○ Low
	High risk	400 per 1000		
Hospital readmission (all cause) Low risk	300 per 1000	285 per 1000 (261 to 312)	RR 0.95 (0.87 to 1.04)	⊕⊕○○ Low
	High risk	600 per 1000		
Hospital emergency department contacts (all cause) Low risk	100 per 1000	73 per 1000 (52 to 103)	RR 0.73 (0.52 to 1.03)	⊕⊕○○ Low
	High risk	300 per 1000		

Margin of error = Confidence interval (95% CI) RR: Risk ratio GRADE: GRADE Working Group grades of evidence (see above and last page)

Relevance of the review for low-income countries

→ Findings	▷ Interpretation*
APPLICABILITY	
→ None of the randomised trials included in the review was conducted in a low-income country.	<i>▷ Evidence from high-income countries suggests that medication review may not reduce mortality or readmissions. ▷ In addition to considering the uncertainty about the benefits of medication review found in these trials, in low-income countries the availability of resources, including pharmacists with appropriate training, and the cost of the intervention (including training) should be considered.</i>
EQUITY	
→ There was no information in the included studies regarding the differential effects of the interventions for disadvantaged populations.	<i>▷ Resources needed for interventions may be less available in disadvantaged settings.</i>
ECONOMIC CONSIDERATIONS	
→ One trial estimated that medication review would cost between USD 1530 and USD 4760 to avoid one emergency department contact, for one patient for a year.	<i>▷ Prior to implementing medication review, local costing should be undertaken.</i>
MONITORING & EVALUATION	
→ Medication review may reduce emergency department contacts among elderly hospitalised patients, but may have little if any effect on mortality and hospital readmissions. → No randomised trial evaluating the effects of medication review in a low-income country was found.	<i>▷ The impacts of medication review should be evaluated in randomised trials prior to scaling up its use.</i>

*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

Additional information

Related literature

Bulloch MN, Carroll DG. When one drug affects 2 patients: a review of medication for the management of non labor-related pain, sedation, infection, and hypertension in the hospitalized pregnant patient. *J Pharm Pract* 2012; 25:352-67.

Holland R, Desborough J, Goodyer L, et al. Does pharmacist-led medication review help to reduce hospital admissions and deaths in older people? A systematic review and meta-analysis. *Brit J Clin Pharm* 2008; 65:303-16.

Nkansah N, Mostovetsky O, Yu C, et al. Effect of outpatient pharmacists' non-dispensing roles on patient outcomes and prescribing patterns. *Cochrane Database Syst Rev* 2010; (7): CD000336.

Allred DP, Raynor DK, Hughes C, et al. Interventions to optimise prescribing for older people in care homes. *Cochrane Database Syst Rev* 2013; (2): CD009095.

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Conflict of interest

None declared. For details, see: www.supportsummaries.org/coi

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This review should be cited as

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The summary should be cited as

Ciapponi A. Does medication review for hospitalised patients reduce morbidity and mortality? March 2017. 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

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

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

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

Norad, the Norwegian Agency for Development Cooperation, supports the Norwegian EPOC satellite and the production of SUPPORT Summaries. 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

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