Interventions to improve adherence to self-administered medications for chronic diseases in the United States: a systematic review


CRD summary
This review concluded that case management, patient education with behavioural support, and reducing out-of-pocket expenses each improved medication adherence for more than one condition. Whether they could be applied to or improve long-term adherence and health outcomes was uncertain. This was a well-conducted review, and the conclusions are likely to be reliable.

Authors' objectives
To assess the comparative effectiveness of patient, provider, systems, and policy interventions that aim to improve medication adherence for chronic health conditions in the USA.

Searching
MEDLINE and The Cochrane Library were searched for studies published in English and included from 1994 to June 2012. Reference lists of relevant reviews were searched.

Study selection
Randomised controlled trials (RCTs) and observational studies conducted in out-patient primary and specialty care, and community-based and home-based settings were eligible for inclusion if they assessed the effectiveness of interventions to improve adherence to self-administered medication for the secondary or tertiary prevention of chronic diseases in adults. Studies conducted in institutional settings or in patients with acute conditions were excluded, as were studies that evaluated interventions to improve adherence to antiretroviral therapy or medications for mental illness or substance abuse. Studies had to be conducted in the USA.

Nearly 40% of the interventions evaluated were for patients only, and just over half were for more than one target (patient, provider, systems, or policy). About half of the interventions were delivered by a pharmacist, physician, or nurse and about half involved at least some face-to-face contact. The medical condition varied considerably across studies, but most patients had cardiovascular disease, diabetes, hypertension, depression or hyperlipidaemia.

Two reviewers independently selected studies for the review; disagreements were resolved by consensus or consultation with a third reviewer.

Assessment of study quality
Two reviewers independently assessed the risk of bias, in the included studies, for the randomisation method, adequacy of allocation concealment, strategies to recruit patients, similarity at baseline, blinding, contamination, attrition, pre-specification of outcome measures, confounders (where appropriate), justification of medication adherence thresholds, and the validity, consistency and reliability of outcome measures. Studies considered to be at a high risk of bias (serious errors in their design or analysis) were excluded. The strength of the evidence was graded based on the risk of bias, and the consistency, directness, and precision of the results.

Disagreements were resolved by consensus or consultation with a third reviewer.

Data extraction
One reviewer extracted the proportion of patients with improved adherence and/or summary estimates, such as risk ratios, hazard ratios or odds ratios, with a measure of variance, for relevant outcomes; data were checked by a second reviewer.

Methods of synthesis
Studies were combined in a narrative synthesis, organised by clinical condition and intervention type. Study details were available in the full report (see Other Publications of Related Interest). Differences between studies were discussed in
**Results of the review**

Seventy-three studies met the inclusion criteria; 69 were RCTs and four were observational studies. Only 15 studies (24%) were sufficiently powered to report adherence as a primary outcome. Of the 73 studies, 67 were considered to be at low or medium risk of bias; from the full report, most of these were at medium risk.

Many pathways provided opportunities to improve medication adherence across clinical conditions. There was relatively little evidence linking higher adherence to improvements in other outcomes, such as biomarkers, morbidity, mortality, quality of life, patient satisfaction, or health care use.

Of the 62 trials evaluating patient, provider, or systems interventions, 33 reported improvement in medication adherence. Of these 33, 18 reported improvements in at least one health outcome, eight reported no improvements, and seven did not evaluate changes in health outcomes.

Evidence showed that many, but not all, effective interventions improved medication adherence for people with hypertension, heart failure, depression and asthma. One intervention was found to be effective for each of diabetes, hyperlipidaemia, and musculoskeletal diseases.

Educational interventions, with behavioural support through continued patient contact over several weeks or months, were found to be effective for hypertension, hyperlipidaemia, heart failure, and myocardial infarction. Case management was found to be effective for diabetes, hypertension, heart failure, and depression.

Five policy interventions reported significant improvements in adherence to medications for cardiovascular conditions in those whose out-of-pocket expenses for prescription medications were reduced by either reduced medication co-payments or improved prescription drug coverage.

Further results were reported in the paper and the full report.

**Cost information**

There was relatively little evidence linking higher adherence to improvements in costs.

**Authors’ conclusions**

Case management, patient education with behavioural support, and lower out-of-pocket expenses each improved medication adherence for more than one condition. The evidence on whether these improved or could be applied to long-term adherence and health outcomes was limited.

**CRD commentary**

This review addressed a clear research question and the inclusion criteria were broad, but relevant and reproducible. Relevant sources were searched, for studies published in English, which was appropriate for the USA. Many studies were included, but the variety between them meant that few evaluated each combination of population, intervention, and outcome; additional unpublished studies could have been helpful if available. Each stage of the review process was conducted by two people, reducing the risks of errors and bias. Study quality was assessed, using appropriate criteria, and the complete results were published in the full report. The decision to conduct a narrative synthesis seems to have been appropriate.

This was a well-conducted review, and the conclusions are likely to be reliable.

**Implications of the review for practice and research**

**Practice:** The authors stated that decision-makers should take care in selecting components of complex interventions to improve medication adherence.

**Research:** The authors stated that future studies should clearly describe each intervention component. Factorial designs could assess both the additive and multiplicative effects of intervention components. Studies should use the guidelines of the Standards for Quality Improvement Reporting Excellence group to clarify the mechanisms by which the intervention components produce changes, the course of the implementation, and the success of tests of the mechanism.
of action. They stated that new studies should question which specific elements of multi-component interventions work best and how these interventions could be improved to increase adherence and improve health outcomes.

**Funding**
Funded by the Agency for Healthcare Research and Quality.

**Bibliographic details**

**PubMedID**
22964778

**DOI**
10.7326/0003-4819-157-11-201212040-00538

**Original Paper URL**
http://annals.org/article.aspx?articleid=1357338

**Additional Data URL**

**Other publications of related interest**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Case Management; Chronic Disease /drug therapy; Comparative Effectiveness Research; Health Policy; Humans; Insurance Coverage; Medication Adherence; Outcome Assessment (Health Care); Patient Education as Topic; Self Administration; United States

**AccessionNumber**
12012045714

**Date bibliographic record published**
12/10/2012

**Date abstract record published**
17/10/2012

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.