Medication taking and diabetes: a systematic review of the literature

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CRD summary
This review concluded that several barriers to medication adherence in people with diabetes had been suggested, but more intervention studies were required. Although the review process was not fully reported, and quality of the included studies not assessed, the author's conclusions were suitably cautious and their recommendations for practice and research are likely to be reliable.

Authors' objectives
To evaluate interventions to improve adherence to medication by people with type 1 or type 2 diabetes.

Searching
PubMed, The Cochrane Library and Health and Psychosocial Instruments were searched for studies published in English between 1990 and May 2007; search terms were reported. Bibliographies of relevant reviews were scanned.

Study selection
Retrospective and prospective studies, including database analyses and surveys and questionnaires, of people of any age with type 1 or type 2 diabetes who used pharmacologic therapy were eligible for inclusion if adherence to diabetes medications were reported. Accepted measures of adherence were self-report, pill counts, medication possession ratios and electronic monitoring devices. Details about how adherence was determined had to be reported. Included studies assessed a range of drug regimens (such as oral agents and insulin, monotherapy and polytherapy) across a wide range of settings. The mean age of participants ranged from 13 to 75.5 years. Mean baseline HbA1c (glycated haemoglobin) ranged from 7.1% to 12.7% in the prospective studies. Observation periods ranged from six months to seven years for retrospective studies. Follow-up ranged from four weeks to 13 months in prospective studies.

The authors stated neither how studies were selected for the review nor who performed the study selection.

Assessment of study quality
Study quality was not systematically assessed.

Data extraction
Adherence rates were extracted from each study. Data were extracted independently; the number of reviewers and how disagreements were resolved were not reported.

Methods of synthesis
The studies were combined in a narrative synthesis, ordered by study design. Differences between studies were discussed in the text and study details and results tabulated.

Results of the review
Retrospective analyses (21 studies) reported adherence rates that ranged from 31% to 87% (11 studies) and persistence rates (proportion still taking medication) at 12 months that ranged from 16% to 63% (three studies) and at 24 months that ranged from 29% to 70% (two studies). Only one study evaluated insulin in young people with Type 1 diabetes; it reported 28% of participants used less than their prescribed dose. Some studies reported results for the impact of depression and dosing frequency; these were discussed in the review.

Prospective analyses (seven studies) reported adherence to medication when measured using the medication electronic system that ranged from 53 to 98% (five studies). Surveys reported that problems that affected adherence were side effects (one study) and depression (one study).

Intervention trials (eight studies) reported no impact of pharmacist interventions (two studies), behavioural interventions or telephone contact by a nurse diabetes educator (three studies) and cue-dosing (one study). One study reported significant improvements in adherence with mailed medication refill reminders, unit-dose packaging and a
combination of these. A survey reported that adherence aids affect glycaemic control.

**Authors' conclusions**
Several barriers to medication taking had been suggested for those with diabetes, but well-controlled trials to confirm and resolve these barriers were limited.

**CRD commentary**
The review addressed a clearly defined question, although some inclusion criteria were broad. Relevant databases were searched, but only published studies and English-language papers were included, which increased potential for language and publication biases. Data extraction was conducted in duplicate, but it was unclear whether similar steps were taken to reduce error and bias at other stages of the review. Study quality was not systematically assessed. Insufficient study details were provided for the reader to make an assessment. The decision to combine results using a narrative synthesis seemed appropriate. Study design was taken into consideration. The author's conclusions were suitably cautious and their recommendations for practice and research are likely to be reliable.

**Implications of the review for practice and research**
**Practice:** The authors stated that diabetes educators were in a key position to promote medication taking by recognising potential barriers through screening, implementation of strategies to overcome barriers and provision of follow-up assessment.

**Research:** The authors stated that more intervention studies were required to determine the best strategy or tool to improve adherence to diabetic medication.

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