Computerized decision support systems in primary care for type 2 diabetes patients only improve patients' outcomes when combined with feedback on performance and case management: a systematic review

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CRD summary
This review concluded that computerised decision support systems used in primary care were effective in improving the process of care for people with type 2 diabetes. Adding feedback and/or case management may also improve patient outcome. Limitations in the synthesis mean that the conclusions may not be reliable.

Authors' objectives
To assess the effects of computerised decision support systems, alone or in combination with other quality improvement interventions, in primary care for patients with type 2 diabetes mellitus.

Searching
PubMed, EMBASE and The Cochrane Library were searched from 1990 to 2011 for studies published in English. Search terms were reported. Reference lists of review articles and included trials were searched for additional studies.

Study selection
Randomised controlled trials (RCTs) that compared care for people with type 2 diabetes with or without use of a computerised decision support system were eligible. Trials had to be of systems developed for use in general practice/primary care. A definition of a computerised decision support system was provided in the paper. Trials could report process of care and/or patient outcomes. Trials had to have follow-up of at least six months.

Included trials were conducted in the UK, USA (private and public healthcare), Canada, Korea and several European countries. Most trials compared a computerised decision support system, with or without other interventions such as reminders, with usual diabetes care.

Two reviewers independently selected studies for inclusion. Disagreements were resolved by discussion or by consulting a third reviewer.

Assessment of study quality
Quality was assessed based on nine criteria from the Dutch Cochrane Centre covering randomisation; allocation concealment; blinding of patients, therapists and outcome assessors; comparable groups; completeness of follow-up; intention-to-treat analysis; and equal treatment between groups except for the intervention. Use of a power calculation was also assessed. Studies were given a quality score and only those that scored 5 or more out of 10 were included in the synthesis.

It appeared that quality was assessed by two reviewers independently.

Data extraction
Two reviewers independently extracted data. Disagreements were resolved by discussion or by consulting a third reviewer.

Methods of synthesis
A narrative synthesis was presented. Trials were categorised by type of intervention (computerised decision support system alone or combined with reminders, feedback, case management or a combination of these). Process of care measures and patient outcomes were considered separately.

Results of the review
Twenty RCTs met the inclusion criteria, of which two were excluded from analysis because of low quality. Participant numbers ranged from 62 to 7,412. Eight trials used individual randomisation and 12 were cluster randomised. Mean
quality score was 6.4 (range 3 to 8).

Computerised decision support systems alone (four trials) or combined with reminders (four trials) improved one or more process of care measures but not patient outcomes. There were some discrepancies in reporting the results but decision support systems with feedback on performance (with or without reminders) improved at least one process of care measure in one trial and at least one patient outcome in two trials. Decision support combined with case management improved patient outcomes in two trials. In two trials of computerised decision support combined with reminders, feedback and case management, both patient and process of care outcomes were improved. Most trials showed a mixture of statistically significant and non-significant results (details in the paper).

**Authors' conclusions**

Computerised decision support systems used in primary care effectively improved the process of care for patients with type 2 diabetes. Adding feedback and/or case management may also improve patient outcome.

**CRD commentary**

The review question and inclusion criteria were clear. The search was adequate, but restriction to English studies means that some relevant studies could have been omitted. No search for unpublished studies was reported and publication bias was not assessed. Review methods minimised risk of errors or bias affecting the review process. Study quality was assessed although the generation of a quality score weighted all aspects equally and was not necessarily appropriate. Trials considered low quality were omitted from the synthesis.

A narrative synthesis was appropriate in view of the range of interventions and outcomes included. The distinction between process and patient outcomes was helpful but the vote counting approach used failed to take account of differences in sample size and quality between trials. Only one trial was from the UK, which meant that generalisability to NHS settings was uncertain. The authors' conclusions generally reflect the evidence presented but these limitations mean that the conclusions may not be reliable.

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

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that further research should assess the long-term effectiveness of computerised decision support systems in diabetes management and their cost-effectiveness.

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