Effects of computerized clinical decision support systems on practitioner performance and patient outcomes: a systematic review.

Review
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Effects of Computerized Clinical Decision Support Systems on Practitioner Performance and Patient Outcomes
A Systematic Review

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Full Text

Abstract

Context Developers of health care software have attributed improvements in patient care to these applications. As with any health care intervention, such claims require confirmation in clinical trials.

Objectives To review controlled trials assessing the effects of computerized
clinical decision support systems (CDSSs) and to identify study characteristics predicting benefit.

**Data Sources** We updated our earlier reviews by searching the MEDLINE, EMBASE, Cochrane Library, Inspec, and ISI databases and consulting reference lists through September 2004. Authors of 64 primary studies confirmed data or provided additional information.

**Study Selection** We included randomized and nonrandomized controlled trials that evaluated the effect of a CDSS compared with care provided without a CDSS on practitioner performance or patient outcomes.

**Data Extraction** Teams of 2 reviewers independently abstracted data on methods, setting, CDSS and patient characteristics, and outcomes.

**Data Synthesis** One hundred studies met our inclusion criteria. The number and methodologic quality of studies improved over time. The CDSS improved practitioner performance in 62 (64%) of the 97 studies assessing this outcome, including 4 (40%) of 10 diagnostic systems, 16 (76%) of 21 reminder systems, 23 (62%) of 37 disease management systems, and 19 (66%) of 29 drug-dosing or prescribing systems. Fifty-two trials assessed 1 or more patient outcomes, of which 7 trials (13%) reported improvements. Improved practitioner performance was associated with CDSSs that automatically prompted users compared with requiring users to activate the system (success in 73% of trials vs 47%; \( P = .02 \)) and studies in which the authors also developed the CDSS software compared with studies in which the authors were not the developers (74% success vs 28%; respectively, \( P = .001 \)).

**Conclusions** Many CDSSs improve practitioner performance. To date, the effects on patient outcomes remain understudied and, when studied, inconsistent.

**Editorial**

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