

Prompting Clinicians: A Systematic Review of Preventive Care Reminders

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Prompting clinicians to offer preventive care procedures has been shown to increase the use of these procedures. This study is an update of a systematic review examining the effect of reminder systems on offers of preventive care to patients. Of 1,404 eligible studies, 23 were included. The studies were evaluated according to their intervention type and use of computerized methods. We found that although computerized reminder systems have become more common, paper-based reminders were the most effective reminder strategy.

Introduction: Every patient encounter with the health care system is an opportunity to provide preventive care; however, clinicians do not have adequate time to provide all relevant preventive care services. Reminder systems can prompt clinicians and patients to increase the use of preventive services. Prompts can be electronic or paper-based and may be relatively easy to implement. With the increased use of clinical information systems, the technology infrastructure may be better suited to remind clinicians to offer patients preventive care. This systematic review provides an update to Balas et al., Arch Intern Med (2000), and examines whether the proportion of studies reporting the impact of computerized reminder systems for preventive care has increased.

Methods: We adapted the study methodology of Balas et al. to include randomized controlled trials. We included trials that reminded clinicians for one of 16 preventive medicine procedures. We performed electronic literature searches (1/1/97–12/31/04) using MEDLINE, CINAHL, Web of Science, Health and Psychosocial Instruments, and the Health Reference Center. We excluded studies targeting patients only. Two independent reviewers evaluated each article's abstract and disagreements were resolved by consensus. Agreement ranged from 0.96 to 0.99 (Yule's Q). Articles meeting inclusion criteria were scored by 2 reviewers using a technique developed by Balas et al., Med Care (1995) with an arbitrary range of (0-100) and included if the average score was at least 50. "Computerized" prompts were entirely electronic, with algorithms determining eligible patients, and prompts being provided upon access to the clinical information system. We defined reminders as "computer-generated" when algorithms determined eligible patients, but paper-based prompts

reminded the clinician and/or patient. "Paper-based" reminders included placing memos, stickers, or a slip of paper on the patient's chart.

Results: From 1,404 eligible abstracts, 31 articles were retrieved and 23 met inclusion criteria (average score 65 ± 6). Of the 8 excluded articles, 1 examined only the system, and not the usage, and 7 scored less than 50. Sixteen (70%) of the studies placed a flag, a sheet, or a sticker in the patient's chart as a reminder with an average difference of 20%. A comparison of prompting techniques is shown in Table 1.

Table 1 Comparison of Prompting Techniques

Primary Reminder Method	Number of studies/total interventions	Average difference (range)
Computerized	4/14	13% (-5 to 50)
Computer-generated	8/12	16% (-1 to 37)
Non-computerized	11/33	19% (-2 to 67)

78% of studies occurred in an outpatient and 22% in an inpatient setting. In the inpatient setting only vaccination strategies were studied. The effect of prompting on the most common procedures is given in Table 2. Overall only 4 out of 23 studies were true computerized reminder systems.

Table 2 Effect of Prompting for Selected Procedures

Targeted procedure	Number of studies/total interventions	Increased use (range)
Vaccination	10/17	31% (3 to 67)
FOBT	4/5	20% (-2 to 40)
Papanicolaou smear	4/5	15% (3 to 32)
Mammogram	8/10	10% (-1 to 20)
Other	4/10	8% (-5 to 22)

Discussion: In this review, 17% of studies tested computerized reminders, compared with only 3% in the Balas review. The effectiveness of the computerized reminder systems is variable. Vaccination reminders had the largest effect in increasing preventive care use, possibly because the vaccination can be performed during the visit, and does not require an additional appointment for the patient.

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