

Rule-based computerized reminders increased ordering of preventive services in an inpatient setting

Dexter PR, Perkins S, Overhage JM, et al. A computerized reminder system to increase the use of preventive care for hospitalized patients. *N Engl J Med*. 2001 Sep 27;345:965-70.

QUESTION

In hospitalized patients, do rule-based computerized reminders increase ordering of preventive care therapies?

DESIGN

18-month randomized (unclear allocation concealment*), unblinded,* controlled trial.

SETTING

General-medicine service of Wishard Memorial Hospital, Indianapolis, Indiana, USA.

PATIENTS

6371 patients (mean age 53 y, 50% women, 51% black) admitted to a general-medicine service. Patients were eligible for therapy if their electronic medical records had ≥ 1 indication for 1 of the selected preventive therapies; no evident therapy contraindications; no active orders for therapy; and if either of the 2 vaccinations was indicated, no record that the vaccination was given within an appropriate time frame. Follow-up was 100%.

INTERVENTION

8 general-medicine teams were allocated to rule-based computerized reminders (4 medical teams) or no reminders (4 medical teams). Patients ($n = 6371$, 10 065 hospitalizations) were admitted to the wards using a system that distributed admissions equally among the teams. Rule-based computerized reminders for 4 preventive therapies (pneumococcal vaccinations, influenza vaccinations, prophylactic enteric-coated aspirin for cardiovascular disease, and prophylactic subcutaneous heparin) were provided to resident physicians and medical students during order entry for daily care, patient transfer, or discharge. In the intervention group, the system generated reminders as prewritten orders with explanatory text. Physicians could accept or reject the reminders. If a physician ordered the targeted therapy, no more reminders for that therapy appeared. In the control group, the computer logged the reminders but did not display them to the physician.

MAIN OUTCOME MEASURE

Percentage of hospitalizations during which preventive interventions were ordered.

MAIN RESULTS

28% of patients had > 1 hospitalization. 3416 patients (54%) were eligible for ≥ 1 preventive action. More hospitalizations during which a therapy was ordered occurred for patients with rule-based computerized reminders for pneumococcal vaccinations (36% vs 0.8%, $P < 0.001$), influenza vaccinations (51% vs 1.0%, $P < 0.001$), subcutaneous heparin (32% vs 19%, $P < 0.001$), and aspirin at discharge (36% vs 28%, $P < 0.001$) than for those without reminders.

CONCLUSION

In hospitalized patients, rule-based computerized reminders increased ordering of preventive interventions.

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COMMENTARY

Most clinicians continue in a love-hate relationship with the electronic clinical information systems in their institutions or offices. Few health care technologies offer such wonderful potential to improve the quality of health care across the breadth of care. Yet proof of an important effect on patient outcomes remains elusive (1).

The well-done study by Dexter and colleagues continues a long history of research by the Regenstrief informatics group on the effect of electronic health records and computerized decision support (CDS). Trials in this area of research are enormously difficult to do because they, by necessity, involve multiple providers and patients clustered on wards or in practices, complex interventions that may evolve over time, and such challenges as cointervention, contamination, and lack of blinding. The authors have shown that the posting of a computerized order reminder to medical trainees for simple and noncontroversial preventive inpatient care (immunizations, prophylactic heparin, or aspirin), if repeated daily until acted on, is highly effective for getting the preventive maneuvers applied.

Although studies on CDS provide clinicians with reassurance that computers have important uses, their applicability remains a major

problem. High-quality, patient-specific CDS requires an established electronic health record (EHR) infrastructure with reliable technical, privacy, and change-management support. For many institutions and practices, the investment in time, dollars, and human resources for this infrastructure is still too great. However, innovations, including Internet-based EHR and health data standardization, combined with an increasingly information-hungry public worried about such issues as patient safety, will probably bring EHR and CDS to our doorsteps within the decade. At that point, time currently spent searching for such information as laboratory test results, history, or current medications can then be directed toward critiquing the quality and applicability of the CDS messages for individual patients.

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Reference

- Hunt DL, Haynes RB, Hanna SE, Smith K. Effects of computer-based clinical decision support systems on physician performance and patient outcomes: a systematic review. *JAMA*. 1998;280:1339-46.